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FINAL FIELD SAMPLING AND ANALYSIS REPORT
ORGANIC SAMPLING
LONG LAKE - MITCHELL, ILLINOIS

BY:
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REGION 6 - FIELD OPERATIONS SECTION
BUREAU OF LAND
2009 MALL STREET
COLLINSVILLE, ILLINOIS 62234
OCTOBER 1999

FINAL FIELD SAMPLING AND ANALYSIS REPORT
LONG LAKE - MITCHELL ILLINOIS

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1.0 INTRODUCTION

The Illinois Environmental Protection Agency sampled zinc oxide sludge from the East Cooling Canal, sediment from Long Lake and a background soil sample at the Chemetco facility for the presents of dioxin and furan. This document is the Field Sampling and Analysis Report for sediment, soil and sludge from Chemetco and Long Lake.

The sampling event occurred on August 10, 1999 and was undertaken in accordance with the Site-Specific Sampling and Analysis Plan (SAP) For Dioxin and Furan in Sediment and Zinc Oxide, Chemetco, Inc. Hartford, Illinois and Long Lake - Mitchell, Illinois. The sampling team also followed the Bureau of Land Sampling Procedures Guidance Manual, September 1996. The sampling team from the Illinois Environmental Protection Agency's Collinsville Regional Office used ARDL in Mt. Vernon, Illinois as a contract laboratory. ARDL subcontracted the dioxin and furan sampling to Triangle Laboratory, Inc. in Durham, North Carolina.

The sampling event was undertaken by Collinsville Field Operation Section personnel Chris Cahnovsky, Tom Miller and John Senjan. Maps showing the sampling area layout and sample locations are provided in Appendix A. A Photograph Log of the sampling event is provided in Appendix B. Copies of the Chain of Custody forms and Unified Sampling Documents are provided in Appendix C and the laboratory reports are provided in Appendix D. A copy of the SAP is included as Appendix E.

On July 16, 1999, the Illinois Department of Natural Resources, Division of Fisheries obtained fish samples from Long Lake. The fish sampling was carried out in accordance with IDNR procedures and was not part of the SAP. The IDNR was contacted by the Illinois Environmental Protection Agency to obtain fish samples for dioxin and furan analysis.

2.0 SAMPLING PROCEDURES

2.1 Sediment

A total of three sediment samples were taken during this sampling event. The sediment samples were labeled X109 through X111. Samples X109 through X111 were obtained using separate and clean stainless steel bucket augers. The samples were removed from the augers using separate and clean stainless steel scoops. Each sample was placed into two 8-ounce glass jars.

Sample X109 was taken about 20 feet west of Containment Area #3. Sample X110 was taken on the east side of Containment Area #3. Sample X111 was taken about 15 feet north of Franko Lane. The sample depths of the sediment samples were 0-10 inches.

2.2 Soil

One background soil sample was taken in the front yard of Chemetco's "farmhouse". This background sample was labeled X112. Sample X112 was taken at a depth of 0 - 6 inches. This sample was taken using a stainless steel scoop and it as placed into two 8-ounce glass jars.

2.3 Zinc Oxide Sludge

One sample of zinc oxide sludge was taken from the bottom of the east side of the East Cooling Water Canal. This sample was taken using a stainless steel bucket auger at a depth of 0-10 inches. The sample was labeled X202 and placed in two 8-ounce glass jars.

2.4 Fish Samples

The IDNR used a shock boat to obtain the fish for sampling. The area samples was the section of the lake north of Franco Lane and south of the "slag road". In this section big buffalo, big carp and small buffalo were obtained. The IDNR filleted the fish in Grafton, Illinois.

The fish samples were in the possession of IDNR until August 9, 1999 when the Illinois Environmental Protection Agency took possession of the fish samples. The fish samples were taken to ARDL in Mt. Vernon by the Agency on August 10, 1999. The fish samples remained frozen at all times.

A sample of big buffalo and big carp from the north section of Long Lake were analyzed for dioxins and furans by ARDL, Inc. The big buffalo fillets were labeled 02420 and the carp fillets were labeled 02209.

2.5 Sample Preservation

All samples were sealed with evidence tape and placed in an iced cooler for shipment to ARDL, Inc. in Mt. Vernon, Illinois.

2.6 Sample Custody and Shipment

All sample containers were appropriately labeled in accordance with the SAP and the Bureau of Land Sampling Procedures Guidance Manual, September 1996. A Chain of Custody - DLPC/FOS Unified Sample Document accompanied the samples from the point of origin to ARDL. All samples collected by the Agency remained in the custody of Collinsville Regional Office personnel until shipment to ARDL. The samples were hand delivered to ARDL on August 10, 1999 and were received by ARDL with the evidence tape seals intact.

2.7 Equipment Decontamination

Since separate and clean sampling equipment was used to obtain each sample, no field documentation was needed.

3.0 RESULTS

The results are attached as Appendix D to this report. The sample results were forwarded to the Office of Chemical Safety's Toxicological Assessment Unit for interpretation. The following is a key to cross reference the Laboratory ID Numbers with the Field ID Numbers.

Lab ID Number	Field ID Number	Site Location
2448-1	X109	West of Containment #3
2448-2	X110	East of Containment #3
2448-3	X111	North of Franko Lane
2448-4	X112	By Farmhouse (Background)
2448-5	X202	ZnO East Cooling Water Canal
2448-6	02209	Carp Fillet
2448-7	02420	Bigmouth Buffalo Fillet

Lab ID Number	Field ID Number	Dioxin Equivalent (ppt)
2448-1	X109	123 ppt
2448-2	X110	
2448-3	X111	
2448-4	X112	

2448-5	X202	232 ppt
2448-6	02209	
2448-7	02420	

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JUNE 1999

FINAL FIELD SAMPLING AND ANALYSIS REPORT
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1.0 INTRODUCTION

The Illinois Environmental Protection Agency sampled the surface water, sediment and slag in Long Lake in response to the discovery of an unpermitted discharge pipe from the Chemetco facility in Hartford, Illinois. This document constitutes the Field Sampling and Analysis Report for surface water, sediment and slag from the Mitchell portion of Long Lake.

The sampling event occurred on March 15 and 16, 1999 and was undertaken in accordance with the Site-Specific Sampling and Analysis Plan (SAP) Long Lake - Mitchell, Illinois and the Bureau of Land Sampling Procedures Guidance Manual, September 1996. The sampling team from the Illinois Environmental Protection Agency's Collinsville Regional Office utilized the Agency's Champaign, Illinois Inorganics Laboratory to perform the analysis required under the SAP.

The sampling event was undertaken by Collinsville Field Operation Section personnel Chris Cahnovsky, Mike Grant and Tom Miller. Maps showing the sampling area layout and sample locations are provided in Appendix A. A Photograph Log of the sampling event is provided in Appendix B. Copies of the Chain of Custody forms and Unified Sampling Documents are provided in Appendix C and the laboratory reports are provided in Appendix D. A copy of the SAP is included as Appendix E.

2.0 SITE DESCRIPTION

Long Lake is a long narrow body of water that extends from the Mississippi River side of the levee in Hartford, Illinois to an area south of Pontoon Beach. Portions of Long Lake are considered Lacustrine Systems. Lacustrine Systems are usually made up of wetlands and deepwater habitats with all of the following characteristics: (1) within topographic depression or a dammed river channel; (2) lacking trees, shrubs and persistent emergents and; (3) total area exceeds 20 acres. Lacustrine Systems include permanently flooded lakes and reservoirs. Portions of Long Lake are also considered Palustrine Systems. Palustrine Systems includes all non-tidal wetlands dominated by trees, shrubs and persistent emergents. Palustrine Systems also include wetlands lacking such vegetation, but all of the following characteristics: (1) less than 20 acres; (2) active wave-formed or bedrock shoreline features lacking; and (3) water depth in the deepest part of the basin less than 6.6 feet at low water[1]. The portions of Long Lake being sampled under this SAP are primarily Palustrine Systems with intermittent water with depths of seven feet or less.

The area sampled under this SAP includes a portion of Long Lake from near Chemetco's property line to a Franko Lane in unincorporated Madison County, known as Mitchell, Illinois. Also, a small area of Long Lake on the north side of Illinois Route 3 will be sampled. This area was selected because the lake is intermittent and some portions only have water during seasonal flooding. Also, the fill used to construct the field road through the lake is made of secondary copper smelting slag. This type of slag has been found to leach lead and other heavy metals. The slag and sediments surrounding the slag road will be sampled as part of this SAP.

The study area south of the release area is about a 10,000 foot (1.89 miles) section of the lake. The property surrounding the lake is owned by Union Colliery, also known as Ameren UE. The Agency has obtained permission from Ameren UE to access the lake from Union Calliery's property. The area of the lake from Chemetco's property to the first home is about 3,600 feet long. This area is forested and only seasonally flooded[2]. The next approximately 800 feet of Long Lake is open water with an unconsolidated bottom. The next approximately 2,000 feet is predominantly dry or with less than two feet of water but susceptible to seasonal flooding. The remaining approximately 3,600 feet of Long Lake to Franko Lane is open water with an unconsolidated bottom. An unconsolidated bottom is made up of cobble-gravel, sand mud and organic matter.

3.0 SAMPLING PROCEDURES

3.1 Surface Water

A total of eight (8) surface water samples were collected from Long Lake. These samples were analyzed for pH, fluoride, sulfate, total dissolved solids, chloride, turbidity, mercury, magnesium, potassium, antimony, barium, beryllium, chromium, cobalt, lead, nickel, silver, thallium, zinc, calcium, sodium, aluminum, arsenic, boron, cadmium, copper, iron, manganese, selenium, strontium and vanadium. The locations of the samples were predetermined by using maps and aerial photographs. However, due to site conditions, geographical features and locations of residences some sampling locations varied slightly from the original plan. All surface water samples were taken before the co-located sediment samples.

A ten foot john boat was used to reach sampling locations S507 and S506. The depth of the water in these sample locations were between two and three feet deep. Samples S505, S504, S503, S502 and S501 were obtained by wading out to the middle of Long Lake. The depth of the water at these sample locations were between six inches and three feet. Sample S508 was taken from on top of the culvert where Long Lake flows under Rt. 3. In all cases, the samples were obtained using a separate and clean 32-ounce plastic jug with the sample being transferred to two 8-ounce plastic containers.

Samples S507 and S506 were taken on March 15, 1999. Sample S507 was taken from the boat about 1,300 feet north of Franko Lane in about 2.5 feet of water. S507 was taken less than 50 feet from a residence. Sample S506 was taken about 50 feet south of the slag road in about three feet of water.

Samples S505-S508 were taken on March 16, 1999. Sample S505 was taken about 500 feet north of the slag road in about eight inches of water. Sample S504 was taken about 2,000 feet north of the slag road in about ten inches of water. Sample S503 was taken about 2,800 feet north of the slag road in about two feet of water. At this location, logs, branches, sticks and other debris have formed a dam. This dam has created a large pool of water. On the other side of the dam the lake is only a few inches deep and less than three feet across. S503 was taken from the pool on the north side of the dam. This sampling location was several hundred feet from a residence.

Sample S502 was taken about midway between Chemetco's property line and the first residence along Old Alton Road. Sample S501 was taken about 100 feet from Chemetco's property line. This area is a flooded slough which flows into Long Lake. No flow was observed in these two sample locations. The water was between 2-2.5 feet deep and somewhat stagnant.

Sample S508 was taken from a culvert along Rt. 3. This is where Long Lake crosses under Rt. 3. This sample was obtained by submerging a 32-ounce plastic jug into the water from on top of the culvert. The water was transferred to two 8-ounce plastic containers.

3.2 Sediment

A total of eight (8) sediment samples were taken during this sampling event. The sediment samples were labeled X101 through X108. The sediment samples were taken at the same locations as the surface water samples. Samples X107 and X106 were obtain from a boat using separate and clean stainless steel bucket augers. Samples X105 through X101 were taken by wading to the middle of the lake. The sample depth of the sediment samples was 0 - 10 inches. The samples were removed from the auger using separate and clean stainless steel scoops. Each sample was placed into 16-ounce glass jars. Sample X108 was obtained from on top of the culvert using a bucket auger on an extension pole.

The sediment samples were analyzed for pH, total organic carbon, phenols, mercury (total and TCLP), magnesium, arsenic (total and TCLP), antimony (total and TCLP), barium (total and TCLP), beryllium(total and TCLP), chromium (total and TCLP), cobalt, lead (total and TCLP), nickel (total and TCLP), silver (total and TCLP), thallium (total and TCLP), zinc, calcium, sodium, aluminum, boron, cadmium (total and TCLP), copper, iron, manganese, selenium (total and TCLP), strontium, vanadium (total and TCLP) and potassium.

3.3 Slag

A sample of the slag road was obtained during this sampling event. The sample was taken using a stainless steel scoop. Slag of various sizes was collected and placed in a 32-ounce glass jar. This sample was labeled X201. Sample X201 was analyzed for mercury (total and TCLP), magnesium, arsenic (total and TCLP), antimony (total and TCLP), barium (total and TCLP), beryllium(total and TCLP), chromium (total and TCLP), cobalt, lead (total and TCLP), nickel (total and TCLP), silver (total and TCLP), thallium (total and TCLP), zinc, calcium, sodium, aluminum, boron, cadmium (total and TCLP), copper, iron, manganese, selenium (total and TCLP), strontium, vanadium (total and TCLP) and potassium.

What appears to be secondary copper slag has been used to construct a road and a culvert system through Long Lake. Various sizes of slag, ranging from fines to boulders, was used as fill for this road. The slag extended into the lake and was in contact with the water.

3.4 Sample Preservation

All surface water samples were preserved using nitric acid. The appropriate amount of nitric acid, about ten drops, was added to each sample to lower the pH to below 2.0. The samples were sealed with evidence tape and placed in an iced cooler for shipment to the laboratory.

3.5 Sample Custody and Shipment

All sample containers were appropriately labeled in accordance with the Site-Specific Sampling and Analysis Plan (SAP) Long Lake - Mitchell, Illinois, March 1999 and the Bureau of Land Sampling Procedures Guidance Manual, September 1996. A Chain of Custody - DLPC/FOS Unified Sample Document accompanied the samples from the point of origin to the Champaign Laboratory. All samples collected by the Agency remained in the custody of Collinsville Regional Office personnel until shipment to the Champaign Laboratory via United Parcel Service. All samples were shipped on March 16, 1999 and were received by the lab on March 17, 1999 with evidence tape seals intact.

3.6 Equipment Decontamination

Since separate and clean sampling equipment was used to obtain each sample, no field documentation was needed.

4.0 RESULTS

Analytical results of the surface water, sediment and slag are presented in Table 4.1.1 through 4.3.1. Constituents flagged with a "K" were less than value.

4.1 Surface Water

The results of the surface water samples were compared to the Bureau of Water's General Use Water Quality Standards contained in subsection 302.208(g). The results are summarized in Table 4.1.1. The Total Dissolved Solids limit of 1,000 mg/l was exceeded in samples S502, S503, S504, S505 and S506. The highest TSD results was in sample S502 at 1,330 mg/l. The boron limit of 1.0 mg/l was exceeded in samples S502, S503, S504, S505 and S506. The highest boron result was in sample in S502 at 1.70 mg/l. The fluoride limit of 1.4 mg/l was exceeded in samples S501, S502, S503, S504, S505, S506 and S507. The highest fluoride result was in sample S502 at 20 mg/l. The iron limit of 1.0 mg/l was exceeded in samples S501, S503, S504, S505, S506 and S507. The highest iron result was in sample S506 at 3.8 mg/l.

TABLE 4.1.1
Surface Water
Total Metal Concentrations (mg/L)

	S501	S502	S503	S504	S505	S506	S507	S508	302.208[1]
pH (lab)	8.6	9.0	8.4	8.3	8.4	8.2	8.3	8.2	--
TDS	976	1,330	1,100	1,030	1,030	1,010	827	471	1,000
Turbidity	16	18	13	15	17	17	19	20	--
Aluminum	2.0	1.3	3.6	3.0	2.1	5.9	5.4	0.15	--
Antimony	0.007	0.010	0.006K	0.007	0.006K	0.006K	0.008	0.006K	--
Barium	0.097	0.092	0.100	0.110	0.100	0.140	0.150	0.093	5.0
Boron	0.96	1.70	1.20	1.10	1.10	1.10	0.87	0.13	1.0
Cadmium	0.013	0.008	0.008	0.006	0.005K	0.005K	0.005K	0.005K	--
Calcium	77	67	65	71	69	61	59	78	--
Chloride	286	387	321	291	290	275	200	97.3	500
Copper	0.083	0.067	0.052	0.042	0.037	0.029	0.017	0.044	--
Fluoride	11.8	20.0	16.0	14.1	14.3	15.1	12.4	0.30	1.4
Iron	1.5	0.95	2.4	2.0	1.5	3.8	3.6	0.19	1.0
Lead	0.034	0.019	0.017	0.011	0.011	0.012	0.007	0.005	--
Magnesium	20	19	18	20	19	17	16	17	--
Manganese	0.08	0.078	0.16	0.13	0.11	0.30	0.33	0.024	1.0
Nickel	0.077	0.063	0.073	0.061	0.054	0.034	0.014	0.005K	1.0
Potassium	11	15	13	12	12	12	9.5	6.7	--
Sodium	230	360	280	260	260	260	190	47	--
Strontium	0.28	0.25	0.24	0.26	0.25	0.22	0.20	0.23	--
Sulfate	36.0	103.	72.5	53.4	57.1	73.4	10K	10K	500
Vanadium	0.006	0.006	0.009	0.009	0.005K	0.014	0.013	0.005K	--
Zinc	0.27	0.16	0.18	0.14	0.12	0.10 K	0.10 K	0.11	1.0

1. Title 35: Environmental Protection - Subtitle C: Water Pollution - Chapter 1: Pollution Control Board - Subpart B: General Use Water Quality Standards - Section 302.208 Numeric Standard for Chemical Constituents - Subsection 302.208(g).

4.2 Sediment

The sediment data for samples X101 through X108 analyzed to Total Metal Concentrations are summarized in Table 4.2.1 and the TCLP results are summarized in Table 4.2.2. The sediment data for lead suggests that this metal may be slightly elevated in comparison to State-wide sediment data complied by the Illinois Environmental Protection Agency Bureau of Water's Sediment Classification for Illinois Inland Lakes study, updated in 1996[1]. This study found that the normal range of lead in lake sediments is 14-58 mg/kg. Only three of the seven samples collected down-gradient of the Chemetco discharge exceeded this range. The highest was sample X102 at 77 mg/kg. The up-gradient sample, Sample X108 also exceeded at 62 mg/kg.

The normal cadmium levels in Illinois lakes is less than 5.0 mg/kg. Down-gradient from the Chemetco discharge cadmium levels are elevated and highly elevated. The elevated range is between 5 and 13 mg/kg. Elevated samples were X101, X102 and X107 at 11 mg/kg, 7.6 mg/kg and 12 mg/kg, respectively. The highly elevated range for cadmium is 14 mg/kg or greater. Highly elevated samples were X103, X105 and X106 at 18 mg/kg, 58 mg/kg and 19 mg/kg, respectively. The normal range for zinc is 59 to 144 mg/kg. The elevated range for zinc is 145 to 1099 mg/kg. All sediment samples fell in the elevated range for zinc. The highest sample result was X105 at 300 mg/kg.

1. Mitzelfelt, Jeffrey D., Sediment Classification for Illinois Inland Lakes, Illinois Environmental Protection Agency Bureau of Water Division of Water Pollution Control Planning Section Lake and Water Shed Unit, September 1996.

TABLE 4.2.1
Sediment Samples/Total Metal Concentration (mg/kg)

	X101	X102	X103	X104	X105	X106	X107	X108
Aluminum	11,000	11,000	9,800	11,000	12,000	10,000	8,600	8,900
Arsenic	3.40	2.90	5.40	5.60	4.90	3.60	4.60	4.30
Barium	160	150	190	270	130	140	140	170
Beryllium	0.80	0.80	0.70	0.80	0.70	0.70	0.60	0.60
Boron	17	16	15	10	15	8.9	7.4	8.4
Cadmium	11	7.6	18	3.4	58	19	12	2.0
Calcium	4,400	4,000	3,700	4,400	3,600	4,000	4,200	4,400
Chromium	15	14	13	14	15	12	11	12
Cobalt	3.7	3.3	5.0	5.3	4.1	5.0	5.6	5.2
Copper	76	75	50	25	150	84	53	92
Iron	11,000	12,000	12,000	14,000	14,000	13,000	12,000	13,000
Lead	62	77	35	34	71	42	30	62
Magnesium	2,700	2,800	2,700	3,000	3,000	2,600	2,600	3,000
Manganese	130	150	170	220	140	230	240	290
Nickel	58	44	40	29	58	71	50	19
Strontium	25	25	25	30	22	22	21	25
Vanadium	26	25	23	26	29	22	21	21
Zinc	250	210	280	180	390	300	220	210

TABLE 4.2.2
Sediment Samples
TCLP Metal Concentration (mg/L)

	X101	X102	X103	X104	X105	X106	X107	X108
Arsenic	0.030	0.048	0.026	0.010K	0.034	0.070	0.067	0.093
Antimony	0.006K	0.006K	0.006K	0.006K	0.006K	0.006K	0.007	0.006K
Barium	0.380	0.730	0.900	0.810	0.860	0.950	1.200	1.400
Beryllium	0.004	0.004	0.004	0.002	0.003	0.002	0.002	0.003
Cadmium	0.090	0.130	0.110	0.240	0.400	0.100	0.028	0.043
Lead	0.090	0.250	0.043	0.037	0.110	0.057	0.042	0.240
Nickel	0.150	0.180	0.220	0.130	0.280	0.280	0.280	0.110
Vanadium	0.016	0.010	0.009	0.005K	0.005K	0.017	0.022	0.008

4.3 Slag

The results of the slag sample, Sample X201, are summarized in Table 4.3.1. The slag results showed a TCLP level of 14 mg/l. The regulatory limit for lead 5.0 mg/l. In a July 15, 1988 letter from Lawrence Eastep of the Illinois Environmental Protection Agency's Permit Section to Dave Hoff, President of Chemetco, the Agency recommended that is the slag is used as a roadbed material, steps should be taken to keep the potential leaching of lead and cadmium to an absolute minimum. Care should be taken to minimize infiltration and prohibit any potential leachate from impacting the environment. The Agency limited the use of the slag to sites which will always be above the groundwater table and which are removed from permanent surface water bodies.

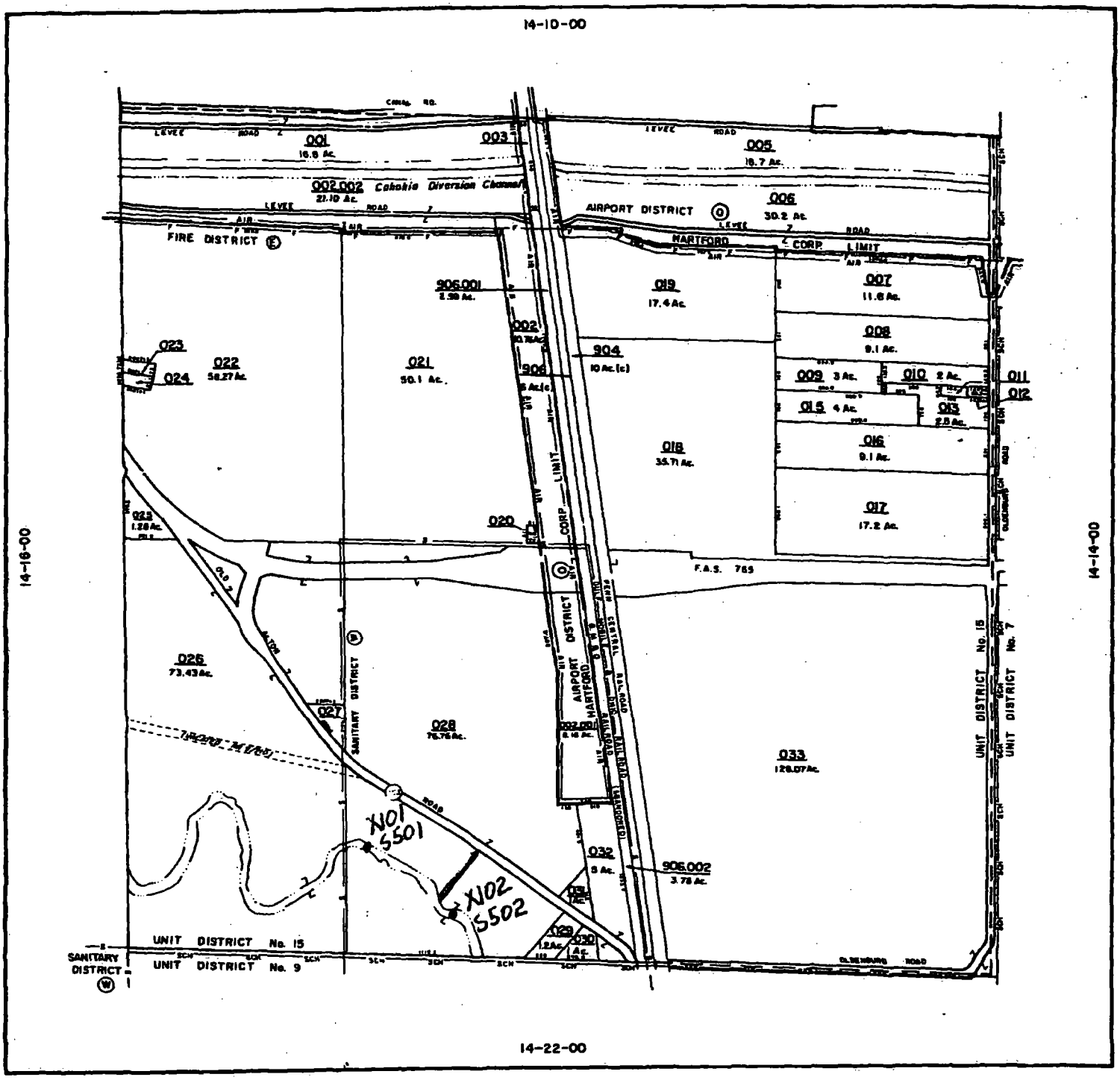
On June 15, 1999, measurements of the slag were taken. The road measures 121 x 22 x 2.5 ft for a total of 6655 cubic feet. This equals about 247 cubic yards of slag, rock and soil.

TABLE 4.3.1
Slag Samples
Total and TCLP Metal Concentrations

	Total (mg/kg)	TCLP (mg/l)	TCLP Limits[1] (mg/l)
Aluminum	11,000	--	--
Barium	240	2.0	100.0
Beryllium	18	0.057	--
Boron	51	--	--
Cadmium	7.9	0.270	1.0
Calcium	19,000	--	--
Chromium	72	0.035	5.0
Cobalt	68	--	--
Copper	1,600	--	--
Iron	120,000	--	--
Lead	2,900	**14.0**	5.0
Magnesium	6,600	--	--
Manganese	1,400	--	--
Nickel	370	0.610	--
Potassium	1,400	--	--
Selenium	9.2	0.010K	1.0
Sodium	510	--	--
Strontium	45	--	--
Thallium	9.2	0.010K	--
Vanadium	32	0.005K	--
Zinc	34,000	--	--

II Title 35: Environmental Protection - Subtitle G: Waste Disposal - Chapter I: Pollution Control Board - Subpart C: Characteristics of Hazardous Waste - Section 721.124 Toxicity Characteristic

APPENDIX A



CHOUTEAU TOWNSHIP

MADISON COUNTY, ILLINOIS

LEGEND

SPECIAL DISTRICTS

CLT BALANCED GOVERNMENTAL SERVICES

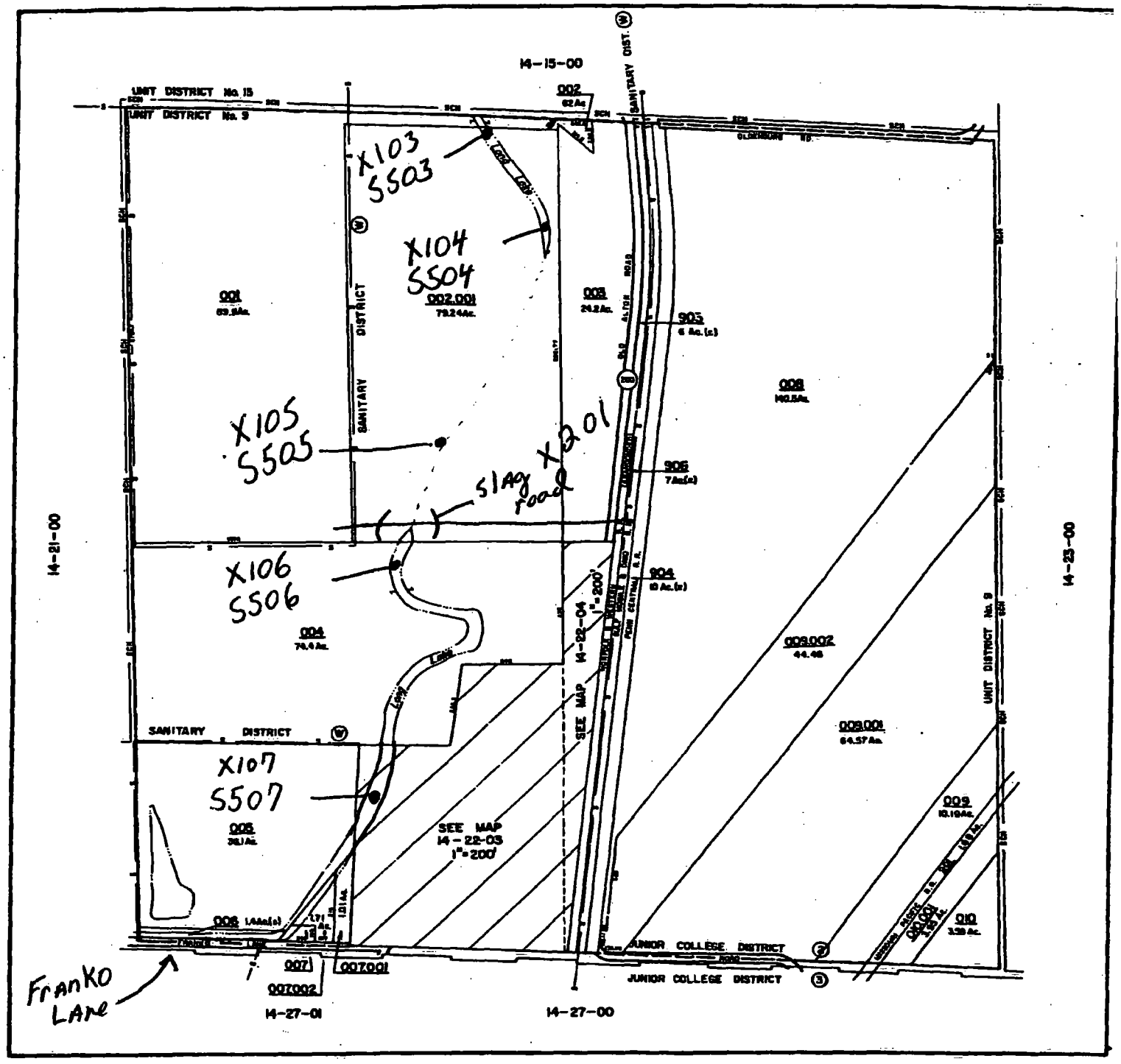
REAL PROPERTY MAP
PREPARED FOR
MADISON COUNTY BOARD MEMBERS

DATE OF MAP: APRIL 27, 1973
DATE OF REVISION:
SCALE: 1" = 400'

CONGRESSIONAL TOWNSHIP NO.

SECTION 15
TOWN 04 NORTH, RANGE 09 WEST
14-15-00

Figure 4-2



CHOUTEAU TOWNSHIP

MADISON COUNTY, ILLINOIS

LEGEND				SPECIAL DISTRICTS			
STATE OR COUNTY LINE	EASEMENT LINE	ORIGINAL SUBDIVISION BLOCK NO. (82)	DIMENSIONS IN FEET (Shortened) 66.0 (±)	TYPE	SYMBOL	NAME	REMARKS
TOWNSHIP, CITY, TOWN LINE	PROPERTY LINE	ORIGINAL SUBDIVISION LOT & NO. -1- -82-	INTERSTATE HIGHWAY	FIRE	—F—	(E)	MITCHELL
SECTION LINE	LAKE SHORE	AREA IN ACRES (Prior Deed) 10.0 Ac.	U.S. HIGHWAY	LIGHT	—L—		
HIGHWAY & STREET R/W	WATER	AREA IN ACRES (Calculated) 10 Ac.(±)	ILLINOIS STATE HIGHWAY	SCHOOL	—SCH—	9 (2)	UNIT DISTRICT JUNIOR COLLEGE DISTRICT No. 536
BLOCK LIGHT LINE	BLOCK NO. 100	DIMENSION IN FEET (Prior Deed) 66.0	COUNTY HIGHWAY	SEWER	—S—	(P)	SPECIAL SERVICE AREA NO. 1
RAILROAD R/W	PARCEL NO. 023	DIMENSION IN FEET (Scaled) 66 (±)	STREET OR TOWN ROAD BY NAME	WATER	—W—		
				PARK	—P—		
				VOTING	—V—		

CONGRESSIONAL TOWNSHIP NO.

SECTION 22

TOWN 04 NORTH, RANGE 09 WEST

14-22-00

MAP NUMBER

CLT BALANCED GOVERNMENTAL SERVICES ATA

The Mapping Division

COLE-LAYER-TRUMBLE COMPANY

REAL PROPERTY MAP

PREPARED FOR

MADISON COUNTY BOARD MEMBERS

Maps & Plats Department

COUNTY OF MADISON

DATE OF MAP: APRIL 29, 1972

DATE OF REVISION: _____

SCALE: 1" = 400'

Figure 4-3


X10B
S30B
H O U T E A U
A M E R I C A N
Pontoon Beach
Four Corners
C H O T E A U

Figure 4-1

APPENDIX B

INSPECTION PHOTOS

DATE: 03/15/99	**SITE #:** 1 1 9 0 0 0 0 0 0 0	**CO.:** Madison
TIME: 11:12	**SITE NAME:** Mitchell/Long Lake	

PHOTOGRAPH TAKEN BY: Chris Cahnovsky

COMMENTS: Pictures taken toward: East

Sample X201 on slag road

---

through Long Lake

ROLL#: 3465 **PHOTO#:** 1

DATE: 03/15/99

TIME: 11:13

PHOTOGRAPH TAKEN BY: Chris Cahnovsky

COMMENTS: Pictures taken toward: West

Photo of slag road through Long

Lake with Sample X201 in

---

photograph

ROLL#: 3465 **PHOTO#:** 2

CNC:jlb

FOS

INSPECTION PHOTOS

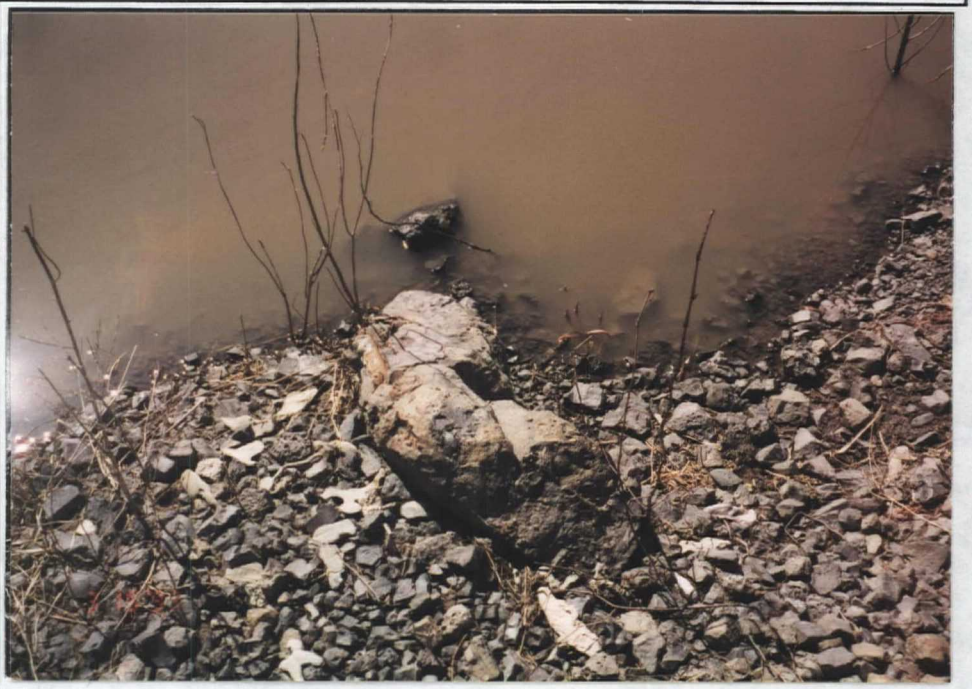
DATE: 03/15/99	**SITE #:** 1 1 9 0 0 0 0 0 0 0	**CO.:** Madison
TIME: 11:14	**SITE NAME:** Mitchell/Long Lake	

PHOTOGRAPH TAKEN BY: Chris Cahnovsky

COMMENTS: Pictures taken toward: South

Slag in contact with water.

ROLL#: 3465 **PHOTO#:** 3



DATE: 03/15/99

TIME: 11:15

PHOTOGRAPH TAKEN BY: Chris Cahnovsky

COMMENTS: Pictures taken toward: South

Photo taken of approximate location of Samples X106 and S506

ROLL#: 3465 **PHOTO#:** 4

CNC:jlb

FOS

INSPECTION PHOTOS

DATE: 03/16/99	SITE #: 1 1 9 0 0 0 0 0 0 0	CO.: Madison
TIME: 9:55	SITE NAME: Mitchell/Long Lake	

PHOTOGRAPH TAKEN BY: Tom Miller

Thomas Miller

COMMENTS: Pictures taken toward: East

Sample location S505 and X105.

ROLL#: 3465	PHOTO#: 6

DATE: 03/16/99
TIME: 9:56

PHOTOGRAPH TAKEN BY: Tom Miller

Thomas Miller

COMMENTS: Pictures taken toward: East

Sample location S505 and X105

ROLL#: 3465	PHOTO#: 7

TWM:jlb

INSPECTION PHOTOS

DATE: 03/16/99	**SITE #:** 1 1 9 0 0 0 0 0 0 0	**CO.:** Madison
TIME: 10:05	**SITE NAME:** Mitchell/Long Lake	

PHOTOGRAPH TAKEN BY: Tom Miller

Thomas J. Miller

COMMENTS: Pictures taken toward: Northeast

Sample location S504 and X104.

ROLL#: 3465 | **PHOTO#:** 8

DATE: 03/16/99

TIME: 10:25

PHOTOGRAPH TAKEN BY: Tom Miller

Thomas J. Miller

COMMENTS: Pictures taken toward: Northeast

Sample location S503 and X103

ROLL#: 3465 | **PHOTO#:** 9

TWM:jlb

FOS

INSPECTION PHOTOS

DATE: 03/16/99	SITE #: 1 1 9 0 0 0 0 0 0 0	CO.: Madison
TIME: 11:25	SITE NAME: Mitchell/Long Lake	

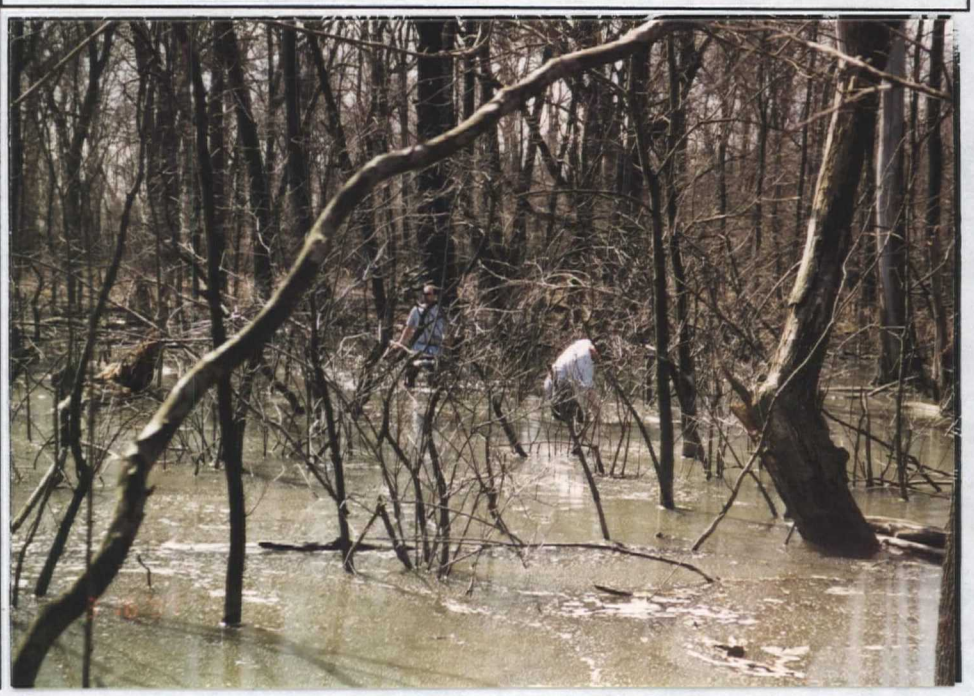
PHOTOGRAPH TAKEN BY: Tom Miller

Thomas J. Miller

COMMENTS: Pictures taken toward: Southwest

Sample location S501 and X101

ROLL#: 3465	PHOTO#: 10



DATE: 03/16/99
TIME: 11:45

PHOTOGRAPH TAKEN BY: Tom Miller

Thomas J. Miller

COMMENTS: Pictures taken toward: Northwest

Sample location S508 and X108

ROLL#: 3465	PHOTO#: 11

TWM:jlb

FOS

INSPECTION PHOTOS

DATE: 03/16/99	**SITE #:** 1 1 9 0 0 0 0 0 0 0	**CO.:** Madison
TIME: 11:50	**SITE NAME:** Mitchell/Long Lake	

PHOTOGRAPH TAKEN BY: Chris Cahnovsky

COMMENTS: Pictures taken toward: North Northwest

Sample S508 and X108 in

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relation to Chemetco

ROLL#: 3465	**PHOTO#:** 12

DATE:
TIME:
PHOTOGRAPH TAKEN BY:
COMMENTS: Pictures taken toward:

ROLL#:	**PHOTO#:**

CNC:jlb

FOS

APPENDIX C

Illinois Environmental Protection Agency
DLPC/FOS [illegible]fied Sample Document
Laboratory: Champaign Springfield
Page 2 of 2

Fund [10]	LPC # [17]	County	Locality
LP41	1190000[illegible]000	Madison	Mitchell/Long Lake
Section [14]	**USEPA #**	**Site Name [19]**	
F	N/A	Mitchell / Long Lake	

Project Manager's Name and Mailing Address: Chris Cahnovsky — Section/Unit: BOL/FOS Collinsville IL

IEPA Laboratory Address and Phone Number (circle one):
2125 S. 1st Street, Champaign, IL 61820, 217/333-6907
825 N. Rutledge Street, Springfield, IL 62702, 217/782-9780

Phone #: 618/346-5120
Case # (if applicable):

Lab Sample # [01]	Parameter Group [03] & Other Analytes: SWAST	SWAST TCLP	[12] Split: "2" is yes	SAVE (y/n)	Collection Information: # Bottles	[15] Field Sample #	[20] Date Collected & Sealed	[21] Time Collected (24 hr clk)	Time Sealed (24 hr clk)	[22] Sampler's Initials	[24] Special Notations	Seal Intact (y/n)
B903265	X		N	N	1	X101	3/16/99	11:25	14:35	CNC	Total Metals w/	
B903266	X		N	N	1	X102	3/16/99	11:00	14:35	CNC	Zinc & Copper	
B903267	X		N	N	1	X103	3/16/99	10:25	14:35	CNC	"	
B903268	X		N	N	1	X104	3/16/99	10:05	14:35	CNC	"	
B903269	X		N	N	1	X105	3/16/99	9:50	14:35	CNC	"	
B903270	X		N	N	1	X106	3/15/99	11:00	15:30	CNC	"	
B903271	X		N	N	1	X107	3/15/99	10:45	15:30	CNC	"	
B903272	X		N	N	1	X108	3/16/99	11:45	14:35	CNC	"	
B903273		X	N	N	1	X201	3/15/99	11:10	15:30	CNC	TCLP Metals	
						Return Results to Chris Cahnovsky 618/346-5120						

Receipt for Samples: Collection of the above-listed sample(s) at the indicated site is hereby acknowledged.
Signature/Title of Facility Representative, Date
Split(s) Offered? y / n Accepted? y / n

Samplers (printed names and signatures): Chris Cahnovsky, Mike Grant

Sealer: I certify that the samples listed above were sealed by me and I wrote my initials, the date, and the time on the seal(s).
Sealer's Signature & Initials: CNC — Date: 3/16/99 — Time (24 hr clk): 14:35

Carriers: I certify that I received the container(s) holding the above sample(s) with the seal(s) intact and the sealer's initials and sealing date written on the seal(s).

Relinquished by (Sealer)	Date	Time (24 hr clk)	Received by	Date	Time (24 hr clk)
	3/16/99 MAR 17 1999	14:45	UPS	3/16/99	14:45

To Sealed Container for Shipment

Laboratory Custodian: I certify that I received the container holding the above sample(s) with the seal integrity as indicated above and the sealer's initials and the date written on the seal(s). After being received, this/these same sample(s) will be retained by laboratory personnel at all times or locked in a secured area.
Printed Name, Signature, and Initials [07] — Date [05] — Time [06] (24 hr clk)

Supervisor releasing results (signature): — Date:

Inorganic Laboratory (Champaign)

GWTOT

Groundwater/surface by SW-846 method listed except as indicated.
Inorganic Bottle Set: A (60 oz.)

Alkalinity, mg/l, 310.1*
Aluminum, µg/l, 6010A
Ammonia-Nitrogen, mg/l, 350.1*
Antimony, µg/l, 7041
Arsenic, µg/l, 7060
Barium, µg/l, 6010A
Beryllium, µg/l, 6010A
Boron, µg/l, 6010A
Cadmium, µg/l, 6010A
Calcium, mg/l, 6010A
Chloride, mg/l, 9251
Chromium, µg/l, 6010A
Cobalt, µg/l, 6010A
Copper, µg/l, 6010A
Cyanide, µg/l, 9010A
Fluoride, mg/l, 340.2*
Iron, µg/l, 6010A
Lead, µg/l, 7421
Magnesium, mg/l, 6010A
Manganese, µg/l, 6010A
Mercury, µg/l, 7470A
Nickel, µg/l, 6010A
Nitrite & Nitrate, mg/l, 9200
pH, 9040A
Phenols, total, µg/l, 9066
Phosphorous, mg/l, 365.1*
Potassium, mg/l, 6010A
Selenium, µg/l, 7740
Silver, µg/l, 6010A
Sodium, mg/l, 6010A
Spec. Conductance, µmhos, 120.1*
Strontium, µg/l, 6010A
Sulfate, mg/l, 9036
Thallium, µg/l , 7841
TDS(ROE), mg/l, 160.1*
Vanadium, µg/l, 6010A
Zinc, µg/l, 6010A

*EPA 600/4-79-020

GWDIS

Groundwater/dissolved by SW-846 method listed except as indicated.
Inorganic Bottle Set: C (32 oz.)

Alkalinity, mg/l, 310.1*
Aluminum, µg/l, 6010A
Ammonia-Nitrogen, mg/l, 350.1*
Antimony, µg/l, 7041
Arsenic, µg/l, 7060
Barium, µg/l, 6010A
Beryllium, µg/l, 6010A
Boron, µg/l, 6010A
Cadmium, µg/l, 6010A
Calcium, mg/l, 6010A
Chloride, mg/l, 9251
Chromium, µg/l, 6010A
Cobalt, µg/l, 6010A
Copper, µg/l, 6010A
Fluoride, mg/l, 340.2*
Iron, µg/l, 6010A
Lead, µg/l, 7421
Magnesium, mg/l, 6010A
Manganese, µg/l, 6010A
Mercury, µg/l, 7470A
Nickel, µg/l, 6010A
Nitrite & Nitrate, mg/l, 9200
Phosphorous, mg/l, 365.1*
Potassium, mg/l, 6010A
Selenium, µg/l, 7740
Silver, µg/l, 6010A
Sodium, mg/l, 6010A
Strontium, µg/l, 6010A
Sulfate, mg/l, 9036
Thallium, µg/l, 7841
Vanadium, µg/l, 6010A
Zinc, µg/l, 6010A

*EPA 600/4-79-020

LEACH

Leachate/canals by EPA 600/R-94/111 and *EPA 600/4-79-020
Inorganic Bottle Sets B+D (100 oz.)

Alkalinity, mg/l, 310.1*
Aluminum, µg/l, 200.7
Ammonia-Nitrogen, mg/l, 350.1*
Arsenic, µg/l, 200.9
Barium, µg/l, 200.7
Beryllium, µg/l, 200.7
Boron, µg/l, 200.7
Cadmium, µg/l, 200.7
Calcium, mg/l, 200.7
Chloride, mg/l, 325.2*
Chromium, µg/l, 200.7
Cobalt, µg/l, 200.7
Copper, µg/l, 200.7
Cyanide, mg/l, 335.4*
Fluoride, mg/l, 340.2*
Hardness, mg/l, 130.1*
Iron, µg/l, 200.7
Lead, µg/l, 200.9
Magnesium, mg/l, 200.7
Manganese, µg/l, 200.7
Mercury, µg/l, 245.1
Nickel, µg/l, 200.7
Nitrite & Nitrate, mg/l, 353.2*
pH, 150.1*
Phenols, total, µg/l, 420.4*
Phosphorous, mg/l, 365.1*
Potassium, mg/l, 200.7
Selenium, µg/l, 200.9
Silver, µg/l, 200.7
Sodium, mg/l, 200.7
Sp. Conduct., µmhos/cm, 120.1*
Strontium, µg/l, 200.7
Sulfate, mg/l, 375.2*
Sulfide, mg/l, 376.1*
Thallium, µg/l, 200.9
Tot. Org. Carbon, mg/l, 415.1*
Tot. Susp. Solids, mg/l, 160.2*
Vanadium, µg/l, 200.7
Zinc, µg/l, 200.7

SURFW

Surface Water/Toxicity EPA 600/R-94/111 and *EPA 600/4-79-020
Inorganic Bottle Set D (44 oz.)

Aluminum, µg/l, 200.7
Ammonia-Nitrogen, mg/l, 350.1*
Arsenic, µg/l, 200.9
Barium, µg/l, 200.7
Beryllium, µg/l, 200.7
Boron, µg/l, 200.7
Cadmium, µg/l, 200.7
Calcium, mg/l, 200.7
Chloride, mg/l, 325.2*
Chromium, µg/l, 200.7
Cobalt, µg/l, 200.7
Copper, µg/l, 200.7
Cyanide, mg/l, 335.4*
Fluoride, mg/l, 340.2*
Hardness, mg/l, 130.1*
Iron, µg/l, 200.7
Lead, µg/l, 200.9
Magnesium, mg/l, 200.7
Manganese, µg/l, 200.7
Mercury, µg/l, 245.1
Nickel, µg/l, 200.7
pH, 150.1*
Phenols, total, µg/l, 420.4*
Phosphorous, mg/l, 365.1*
Potassium, mg/l, 200.7
Selenium, µg/l, 200.9
Silver, µg/l, 200.7
Sodium, mg/l, 200.7
Strontium, µg/l, 200.7
Sulfate, mg/l, 375.2*
TDS(ROE), mg/l, 160.1*
Vanadium, µg/l, 200.7
Zinc, µg/l, 200.7

AWAST

Waste & wastewater, aqueous matrix, totals and TCLP metals in indicated units by SW-846 method listed.
Inorganic Bottle Sets A + B (132 oz.)

Aluminum, µg/l, 6010A
Antimony, µg/l, 7041
Antimony, TCLP, mg/l, 1311/7041
Arsenic, µg/l, 7060
Arsenic, TCLP, mg/l, 1311/7060
Barium, µg/l, 6010A
Barium, TCLP, mg/l, 1311/6010A
Beryllium, µg/l, 6010A
Beryllium, TCLP, mg/l, 1311/6010A
Boron, µg/l, 6010A
Cadmium, µg/l, 6010A
Cadmium, TCLP, mg/l, 1311/6010A
Calcium, mg/l, 6010A
Chromium, µg/l, 6010A
Chromium, TCLP, mg/l, 1311/6010A
Cobalt, µg/l, 6010A
Copper, µg/l, 6010A
Cyanide, µg/l, 9010A
Iron, µg/l, 6010A
Lead, µg/l, 7421
Lead, TCLP, mg/l, 1311/7421
Magnesium, mg/l, 6010A
Manganese, µg/l, 6010A
Mercury, µg/l, 7470A
Mercury, TCLP, mg/l, 1311/7470A
Nickel, µg/l, 6010A
Nickel, TCLP, mg/l, 1311/6010A
pH, 9040A
Phenols, total, µg/l, 9066
Potassium, mg/l, 6010A
Selenium, µg/l, 7740
Selenium, TCLP, mg/l, 1311/7740
Silver, µg/l, 6010A
Silver, TCLP, mg/l, 1311/6010A
Sodium, mg/l, 6010A
Strontium, µg/l, 6010A
Sulfide, mg/l, 9031
Thallium, µg/l, 7841
Thallium, TCLP, mg/l, 1311/7841
Tot. Org. Carbon, mg/l, 9060
Vanadium, µg/l, 6010A
Vanadium, TCLP, mg/l, 1311/6010A
Zinc, µg/l, 6010A

SWAST

Waste & Soils, Sediment/Sludge/Organic Matrices, Totals and TCLP Metals in indicated units by SW-846 method listed.
Inorganic Bottle Set: 16 oz. Glass Bottle

Aluminum, µg/l, 6010A
Antimony, mg/kg, 7041
Antimony, TCLP, mg/l, 1311/7041
Arsenic, mg/kg, 7060
Arsenic, TCLP, mg/l, 1311/7060
Barium, mg/kg, 6010A
Barium, TCLP, mg/l, 1311/6010A
Beryllium, mg/kg, 6010A
Beryllium, TCLP, mg/l, 1311/6010A
Boron, µg/l, 6010A
Cadmium, mg/kg, 6010A
Cadmium, TCLP, mg/l, 1311/6010A
Calcium, mg/kg, 6010A
Chromium, mg/kg, 6010A
Chromium, TCLP, mg/l, 1311/6010A
Cobalt, mg/kg, 6010A
Copper, mg/kg, 6010A
Cyanide, mg/kg, 9010A
Iron, mg/kg, 6010A
Lead, mg/kg, 7341
Lead, TCLP, mg/l, 1311/7341
Magnesium, mg/kg, 6010A
Manganese, mg/kg, 6010A
Mercury, mg/kg, 7471A
Mercury, TCLP, mg/l, 1311/7471A
Nickel, mg/kg, 6010A
Nickel, TCLP, mg/l, 1311/6010A
pH, 9040A
Phenols, total, mg/kg, 9066
Potassium, mg/kg, 6010A
Selenium, mg/kg, 7740
Selenium, TCLP, mg/l, 1311/7740
Silver, mg/kg, 6010A
Silver, TCLP, mg/l, 1311/6010A
Sodium, mg/kg, 6010A
Strontium, mg/kg, 6010A
Sulfide, mg/kg, 9031
Thallium, mg/kg, 7841
Thallium, TCLP, mg/l, 1311/7841
Tot. Org. Carbon, mg/kg, 9060
Vanadium, mg/kg, 6010A
Vanadium, TCLP, mg/l, 1311/6010A
Zinc, mg/kg, 6010A

Combo Groups

Available at the Springfield Laboratory

TOTALS
= VOCs + SVOCs

TCLPS
= TCLP VOCs + TCLP SVOCs

PESTS/PCBS
= Routine Pesticides + PCBs

Inorganic Bottle Sets

Set A (60 oz.):
Cyanide — 8 oz PE
Metals — 32 oz PE
Nutrients — 4 oz PE
Phenol — 8 oz glass
Unpreserved — 16 oz PE

Set B (64 oz.):
Sulfide — 32 oz PE
Unpreserved — 32 oz PE

Set C (32 oz.):
Metals — 32 oz PE
Nutrients — 4 oz PE
Unpreserved — 16 oz PE

Set D (44 oz.):
Cyanide — 8 oz PE
Metals — 8 oz PE
Nutrients — 4 oz PE
Phenol — 8 oz glass
Unpreserved — 16 oz PE

PE = Polyethylene bottle
glass = glass bottle

Organic Laboratory (Springfield)

VOCs

(specify total and/or TCLP)
Water, Soil, Organic Liquids by SW-846, Method 8260 (and 1311 if TCLP)

1,1-Dichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1,1-Trichloroethane
1,3-Dichloropropane
1,1-Dichloroethylene
1,2-Dichloroethane
2-Chloroethylvinyl Ether
2-Hexanone (MBK)
4-Methyl-2-pentanone (MIBK)
Acetone
Benzene
Bromochloromethane
Bromoform
Bromomethane
Carbon Tetrachloride
Carbon Disulfide
Chlorobenzene
Chlorodibromomethane
Chloroethane
Chloroform
Chloromethane
Cis-1,3-Dichloroethylene
Cis-1,3-Dichloropropene
Ethylbenzene
Methyl Ethyl Ketone
Methylene Chloride
Styrene
Tetrachloroethylene
Toluene
Trans-1,2-Dichloroethylene
Trans-1,3-Dichloropropene
Dichlorobromomethane
Trichloroethylene
Trichlorofluoromethane
Vinyl Chloride
Vinyl Acetate
Xylene

SVOCs

(specify total and/or TCLP)
Water, Soil, Organic Liquids by SW-846, Method 8270 (and 1311 if TCLP)

1,3,4-Trichlorobenzene
1,4-Dichlorobenzene
1,3-Dichlorobenzene
1,2-Dichlorobenzene
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,6-Dinitrotoluene
2,4-Dinitrotoluene
2,4,6-Trichlorophenol
2,4,5-Trichlorophenol
2-Chloronaphthalene
2-Chlorophenol
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl Phenyl Ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl Phenyl Ether
4-Methylphenol
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(GHI)perylene
Benzo(k)fluoranthene
Benzoic Acid
Benzyl Alcohol
Bis (2-ethylhexyl) Phthalate
Bis (2-chloroethyl) Ether
Bis (2-chloroethoxy) Methane
Bis (2-chloroisopropyl) Ether
Butyl Benzyl Phthalate
Chrysene
Di-n-butylphthalate
Di-n-octylphthalate
Dibenz(AH)anthracene
Dibenzofuran
Diethylphthalate
Dimethylphthalate
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno(1,2,3-CD)pyrene
Isophorone
n-Nitroso-di-n-propylamine
Naphthalene
Nitrobenzene
Pentachlorophenol
Phenanthrene
Phenol
Pyrene

Organic Bottle Requirements by Matrix & Test

AQUEOUS MATRIX

TOTALS:
VOCs—(2) 40 ml vials + 1 blank
SVOCs—60 oz or 1 gal
PESTS/PCBS—60 oz or 1 gal
HERBS—60 oz or 1 gal
SPECIAL PESTS—60 oz or 1 gal
PH—any container

TCLP:
VOCs—(2) 40 ml vials + 2 blank
SVOCs—60 oz or 1 gal
PESTS—60 oz or 1 gal
HERBS—60 oz or 1 gal

SOIL MATRIX

TOTALS:
VOCs—(2) 2 oz jars
SVOCs—4 oz jar
PESTS/PCBS—4 oz jar
SPEC. PESTS—4 oz jar
HERBS—4 oz jar
PH—any container

TCLP:
VOCs—(2) 2 oz jars
SVOCs—16 oz jar
PESTS—16 oz jar
HERBS—16 oz jar

ORGANIC MATRIX

TOTALS:
VOCs—(2) 2 oz jar
SVOCs—4 oz jar
PESTS/PCBS—4 oz jar
SPEC. PESTS—4 oz jar
HERBS[3]
FLASHPOINT—4 oz jar

TCLP:
VOCs—(2) 2 oz jar
SVOCs—4 oz jar
PESTS—4 oz jar
HERBS[3]

All containers are glass

FOOTNOTES

[1]Maximum of 2 tests from 60 oz; 3 tests from 1 gallon.
[2]Maximum of 2 tests from 8 oz jar. Use 16 oz jar for 2-3 tests.
[3]Not normally performed on oily samples; call the laboratory if this is required.

Individual Tests Available at the Champaign Laboratory

GOD —415.1*
TURBIDITY —180.1*
PH—9040A**
SPECIFIC COND.—9050**
SP. GRAVITY—D1298-67†
VISCOSITY—D1245-67‡

*EPA 600/4-79-020
**SW-846
†ANSI/ASTM
‡ANSI/ASTM

PESTS

Routine Pesticides (specify total and/or TCLP)
Water, Soil, Organic Liquids by SW-846, Method 8080 (and 1311 if TCLP)

Aldrin
γ-BHC (Lindane)
α-Chlordane
γ-Chlordane
DDT, Total
Dieldrin
Endrin
Heptachlor Epoxide
Heptachlor
Methoxychlor
P,P'-DDE
P,P'-DDD
P,P'-DDT

HERBS

Phenoxy Herbicides (specify total and/or TCLP)
Water, Soil, Organic Liquids, by SW-846 Method 8150 (and 1311 if TCLP)

2,4-D
2,4,5-TP (Silvex)
Dalapon
Dicamba
Dinoseb
Pentachlorophenol
Picloram

Individual Tests Available at the Springfield Laboratory

PCBs—All Matrices—8080
PH—Water/Soil—9040A
PLASTICWARE—Org. Liq.—1810
PAINT FILTER—9095
FUEL IDENTIFICATION—1686
Special Pesticides —All Matrices (request by pesticide name)

Assigning Field Numbers

Groundwater G
01(Alpha = Monitor Well
1 = Private Well
2 = Spring
4 = Lysimeter
5 = Public Water Supply
6 = Recovery Well
7 = Injection Well
8 = Recovery Trench
T = Till Well

Leachate L
1 = Flow or Seep
2 = Pond
3 = Collection System

Surface Water S
1 = Upstream
2 = Mid-Site
3 = Downstream
4 = Run-off
5 = Impounded
6 = Run-on

Special X
1 = Soil
2 = Waste
3 = Other

Examples:
G101=Mon. Well Sample
X201=Waste Sample
L201=Leachate Pond Sample
S301=Downstream Sample

SW-846 = Test Methods for Evaluating Solid Waste EPA 600/R-94/111 = Methods for the Determination of Metals in Environmental Samples EPA 600/4-79-020 = Methods for Chemical Analyses of Water and Wastes

The information above is reported as of 5 May 1997 for informational purposes only and is subject to change with no liability on the part of the Agency.

Protection Agency

LPC/FOS Unified Sample Document

Analyses (circle 1): Inorganic Organic

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[02] LP41	[17] LPC # 1190000000	County MADISON	Locality Mitchell / Long Lake
Section [14] F	USEPA # N/A	Site Name [19] Mitchell / Long Lake	

Project Manager's Name and Mailing Address: Chris Cahnovsky

Section/Unit: BOL/FOS Collinsville IL 6

IEPA Laboratory Address and Phone Number (circle one)
2125 S. 1st Street, Champaign, IL 61820, 217/333-6907
825 N. Rutledge Street, Springfield, IL 62702, 217/782-9780

Phone # 618 346-5120

Case # (if applicable)

Parameter Group [03] & Other Analyses: SURFW; pH; Turbidity; 1250

Collection Information

Delivered by [23]

Lab Sample # [01]	[12] Split "2" is yes	SAVE (y/n)	# Bottles	[15] Field Sample #	[20] Date Collected & Sealed	[21] Time Collected (24 hr clk)	Time Sealed (24 hr clk)	[22] Sampler's Initials	[24] Special Notations	Seal Intact? (y/n)
B903274	N	N	3	S501	3/16/99	11:25	14:35	CNC	Total Metals w/	
B903275	N	N	3	S502	3/16/99	11:00	14:35	CNC	Zinc & Copper,	
B903276	N	N	3	S503	3/16/99	10:25	14:35	CNC	pH & Turbidity	
B903277	N	N	3	S504	3/16/99	10:05	14:35	CNC		
B903278	N	N	3	S505	3/16/99	9:50	14:35	CNC	Please Forward	
B903279	N	N	3	S506	3/15/99	11:00	15:30	CNC	results to Chris	
B903280	N	N	3	S507	3/15/99	10:45	15:30	CNC	Cahnovsky at	
B903281	N	N	3	S508	3/16/99	11:45	14:35	CNC	Collinsville BOL/	
									FOS 618/346-	
									5120	

RECEIVED IEPA MAY 17 1999

RECEIVED IEPA MAY 20 1999

Receipt for Samples: Collection of the above-listed sample(s) at the indicated site is hereby acknowledged.

Split(s) Offered? y / n Accepted? y / n

Signature/Title of Facility Representative, Date

COLLINSVILLE OFFICE

Samplers (printed names and signatures)

Chris Cahnovsky

Mike Grant

Sealer: I certify that the samples listed above were sealed by me and I wrote my initials, the date, and the time on the seal(s).

Sealer's Signature & Initials	Date	Time (24 hr clk)
CNC	3/16/99	14:35

Carriers: I certify that I received the container(s) holding the above sample(s) with the seal(s) intact and the sealer's initials and sealing date written on the seal(s).

Relinquished by	Date	Time (24 hr clk)	Received by	Date	Time (24 hr clk)
Sealer)	3/16/99	14:45	UPS	3/16/99	14:45
	MAR 17 1999		To Container for Shipment		

Laboratory Custodian: I certify that I received the container holding the above sample(s) with the seal integrity as indicated above and the sealer's initials and the date written on the seal(s). After being received, this/these same sample(s) will be retained by laboratory personnel at all times or locked in a secured area.

Printed Name, Signature, and Initials [07] | Date [05] | Time [06] (24 hr clk) | Supervisor releasing results (signature):

APPENDIX D

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903274
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S501
DATE COLLECTED : 990316 TIME COLLECTED : 1125 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403 PH-LABORATORY	UNITS : 8.6		P70300 (ROE) TDS @ 180C	MG/L : 976	
P00951 FLUORIDE,TOTAL	MG/L : 11.8		P00940 CHLORIDE,TOTAL	MG/L : 286.	
P00945 SULFATE,TOTAL	MG/L : 36		P00610 AMMONIA-N,TOTAL	MG/L : @CC	
P32730 PHENOLS,TOTAL	UG/L : @MM		P00665 PHOSPHORUS-P,TOTAL	MG/L : @CC	
P00720 CYANIDE,TOT	MG/L : @CC		P00076 TURBIDITY	NTU : 16	
P71900 MERCURY,TOTAL	UG/L : 0.10K		P00916 CALCIUM,TOTAL	MG/L : 77.	
P00927 MAGNESIUM,TOTAL	MG/L : 20.		P00929 SODIUM,TOTAL	MG/L : 230.	
P00937 POTASSIUM,TOTAL	MG/L : 11.		P01105 ALUMINUM,TOTAL	UG/L : 2000	
P01097 ANTIMONY,TOTAL	UG/L : 7		P01002 ARSENIC,TOTAL	UG/L : 10K	
P01007 BARIUM,TOTAL	UG/L : 97		P01022 BORON,TOTAL	UG/L : 960	
P01012 BERYLLIUM,TOTAL	UG/L : 1K		P01027 CADMIUM,TOTAL	UG/L : 13	
P01034 CHROMIUM,TOTAL	UG/L : 5K		P01042 COPPER,TOTAL	UG/L : 83	
P01037 COBALT,TOTAL	UG/L : 5K		P01045 IRON,TOTAL	UG/L : 1500	
P01051 LEAD,TOTAL	UG/L : 34		P01055 MANGANESE,TOTAL	UG/L : 80	
P01067 NICKEL,TOTAL	UG/L : 77		P01147 SELENIUM,TOTAL	UG/L : 10K	
P01077 SILVER,TOTAL	UG/L : 5K		P01082 STRONTIUM,TOTAL	UG/L : 280	
P01059 THALLIUM,TOTAL (2)	UG/L : 10K		P01087 VANADIUM,TOTAL	UG/L : 6	
P01092 ZINC,TOTAL	UG/L : 270				

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : 3903275
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S502
DATE COLLECTED : 990316 TIME COLLECTED : 1100 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403	PH-LABORATORY	UNITS : 9.0	P70300	(ROE) TDS @ 180C	MG/L : 1330
P00951	FLUORIDE,TOTAL	MG/L : 20.0	P00940	CHLORIDE,TOTAL	MG/L : 387.
P00945	SULFATE,TOTAL	MG/L : 103	P00610	AMMONIA-N,TOTAL	MG/L : @CC
P32730	PHENOLS,TOTAL	UG/L : @MM	P00665	PHOSPHORUS-P,TOTAL	MG/L : @CC
P00720	CYANIDE,TOT	MG/L : @CC	P00076	TURBIDITY	NTU : 18
P71900	MERCURY,TOTAL	UG/L : 0.10K	P00916	CALCIUM,TOTAL	MG/L : 67.
P00927	MAGNESIUM,TOTAL	MG/L : 19.	P00929	SODIUM,TOTAL	MG/L : 360.
P00937	POTASSIUM,TOTAL	MG/L : 15.	P01105	ALUMINUM,TOTAL	UG/L : 1300
P01097	ANTIMONY,TOTAL	UG/L : 10	P01002	ARSENIC,TOTAL	UG/L : 10K
P01007	BARIUM,TOTAL	UG/L : 92	P01022	BORON,TOTAL	UG/L : 1700
P01012	BERYLLIUM,TOTAL	UG/L : 1K	P01027	CADMIUM,TOTAL	UG/L : 8
P01034	CHROMIUM,TOTAL	UG/L : 5K	P01042	COPPER,TOTAL	UG/L : 67
P01037	COBALT,TOTAL	UG/L : 5K	P01045	IRON,TOTAL	UG/L : 950
P01051	LEAD,TOTAL	UG/L : 19	P01055	MANGANESE,TOTAL	UG/L : 78
P01067	NICKEL,TOTAL	UG/L : 63	P01147	SELENIUM,TOTAL	UG/L : 13
P01077	SILVER,TOTAL	UG/L : 5K	P01082	STRONTIUM,TOTAL	UG/L : 250
P01059	THALLIUM,TOTAL (2)	UG/L : 10K	P01087	VANADIUM,TOTAL	UG/L : 6
P01092	ZINC,TOTAL	UG/L : 160			

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903276
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S503
DATE COLLECTED : 990316 TIME COLLECTED : 1025 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403 PH-LABORATORY	UNITS :	8.4	P70300 (ROE) TDS @ 180C	MG/L :	1100
P00951 FLUORIDE,TOTAL	MG/L :	16.0	P00940 CHLORIDE,TOTAL	MG/L :	321.
P00945 SULFATE,TOTAL	MG/L :	72.5	P00610 AMMONIA-N,TOTAL	MG/L :	@CC
P32730 PHENOLS,TOTAL	UG/L :	@MM	P00665 PHOSPHORUS-P,TOTAL	MG/L :	@CC
P00720 CYANIDE,TOT	MG/L :	@CC	P00076 TURBIDITY	NTU :	13
P71900 MERCURY,TOTAL	UG/L :	0.10K	P00916 CALCIUM,TOTAL	MG/L :	65.
P00927 MAGNESIUM,TOTAL	MG/L :	18.	P00929 SODIUM,TOTAL	MG/L :	280.
P00937 POTASSIUM,TOTAL	MG/L :	13.	P01105 ALUMINUM,TOTAL	UG/L :	3600
P01097 ANTIMONY,TOTAL	UG/L :	6K	P01002 ARSENIC,TOTAL	UG/L :	10K
P01007 BARIUM,TOTAL	UG/L :	100	P01022 BORON,TOTAL	UG/L :	1200
P01012 BERYLLIUM,TOTAL	UG/L :	1K	P01027 CADMIUM,TOTAL	UG/L :	8
P01034 CHROMIUM,TOTAL	UG/L :	5K	P01042 COPPER,TOTAL	UG/L :	52
P01037 COBALT,TOTAL	UG/L :	5K	P01045 IRON,TOTAL	UG/L :	2400
P01051 LEAD,TOTAL	UG/L :	17	P01055 MANGANESE,TOTAL	UG/L :	160
P01067 NICKEL,TOTAL	UG/L :	73	P01147 SELENIUM,TOTAL	UG/L :	10K
P01077 SILVER,TOTAL	UG/L :	5K	P01082 STRONTIUM,TOTAL	UG/L :	240
P01059 THALLIUM,TOTAL (2)	UG/L :	10K	P01087 VANADIUM,TOTAL	UG/L :	9
P01092 ZINC,TOTAL	UG/L :	180			

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903277
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S504
DATE COLLECTED : 990316 TIME COLLECTED : 1005 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403 PH-LABORATORY	UNITS :	8.3	P70300 (ROE) TDS @ 180C	MG/L :	1030
P00951 FLUORIDE,TOTAL	MG/L :	14.1	P00940 CHLORIDE,TOTAL	MG/L :	291.
P00945 SULFATE,TOTAL	MG/L :	53.4	P00610 AMMONIA-N,TOTAL	MG/L :	@CC
P32730 PHENOLS,TOTAL	UG/L :	@MM	P00665 PHOSPHORUS-P,TOTAL	MG/L :	@CC
P00720 CYANIDE,TOT	MG/L :	@CC	P00076 TURBIDITY	NTU :	15
P71900 MERCURY,TOTAL	UG/L :	0.10K	P00916 CALCIUM,TOTAL	MG/L :	71.
P00927 MAGNESIUM,TOTAL	MG/L :	20.	P00929 SODIUM,TOTAL	MG/L :	260.
P00937 POTASSIUM,TOTAL	MG/L :	12.	P01105 ALUMINUM,TOTAL	UG/L :	3000
P01097 ANTIMONY,TOTAL	UG/L :	7	P01002 ARSENIC,TOTAL	UG/L :	10K
P01007 BARIUM,TOTAL	UG/L :	110	P01022 BORON,TOTAL	UG/L :	1100
P01012 BERYLLIUM,TOTAL	UG/L :	1K	P01027 CADMIUM,TOTAL	UG/L :	6
P01034 CHROMIUM,TOTAL	UG/L :	5K	P01042 COPPER,TOTAL	UG/L :	42
P01037 COBALT,TOTAL	UG/L :	5K	P01045 IRON,TOTAL	UG/L :	2000
P01051 LEAD,TOTAL	UG/L :	11	P01055 MANGANESE,TOTAL	UG/L :	130
P01067 NICKEL,TOTAL	UG/L :	61	P01147 SELENIUM,TOTAL	UG/L :	10K
P01077 SILVER,TOTAL	UG/L :	5K	P01082 STRONTIUM,TOTAL	UG/L :	260
P01059 THALLIUM,TOTAL (2)	UG/L :	10K	P01087 VANADIUM,TOTAL	UG/L :	9
P01092 ZINC,TOTAL	UG/L :	140			

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903278
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S505
DATE COLLECTED : 990316 TIME COLLECTED : 0950 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403 PH-LABORATORY	UNITS : 8.4	P70300 (ROE) TDS @ 180C	MG/L : 1030
P00951 FLUORIDE,TOTAL	MG/L : 14.3	P00940 CHLORIDE,TOTAL	MG/L : 290.
P00945 SULFATE,TOTAL	MG/L : 57.1	P00610 AMMONIA-N,TOTAL	MG/L : @CC
P32730 PHENOLS,TOTAL	UG/L : @MM	P00665 PHOSPHORUS-P,TOTAL	MG/L : @CC
P00720 CYANIDE,TOT	MG/L : @CC	P00076 TURBIDITY	NTU : 17
P71900 MERCURY,TOTAL	UG/L : 0.10K	P00916 CALCIUM,TOTAL	MG/L : 69.
P00927 MAGNESIUM,TOTAL	MG/L : 19.	P00929 SODIUM,TOTAL	MG/L : 260
P00937 POTASSIUM,TOTAL	MG/L : 12.	P01105 ALUMINUM,TOTAL	UG/L : 2100
P01097 ANTIMONY,TOTAL	UG/L : 6K	P01002 ARSENIC,TOTAL	UG/L : 10K
P01007 BARIUM,TOTAL	UG/L : 100	P01022 BORON,TOTAL	UG/L : 1100
P01012 BERYLLIUM,TOTAL	UG/L : 1K	P01027 CADMIUM,TOTAL	UG/L : 5K
P01034 CHROMIUM,TOTAL	UG/L : 5K	P01042 COPPER,TOTAL	UG/L : 37
P01037 COBALT,TOTAL	UG/L : 5K	P01045 IRON,TOTAL	UG/L : 1500
P01051 LEAD,TOTAL	UG/L : 11	P01055 MANGANESE,TOTAL	UG/L : 110
P01067 NICKEL,TOTAL	UG/L : 54	P01147 SELENIUM,TOTAL	UG/L : 10K
P01077 SILVER,TOTAL	UG/L : 5K	P01082 STRONTIUM,TOTAL	UG/L : 250
P01059 THALLIUM,TOTAL (2)	UG/L : 10K	P01087 VANADIUM,TOTAL	UG/L : 5
P01092 ZINC,TOTAL	UG/L : 120		

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903279
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S506
DATE COLLECTED : 990315 TIME COLLECTED : 1100 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403	PH-LABORATORY	UNITS : 8.2	P70300	(RDE) TDS @ 180C	MG/L : 1010
P00951	FLUORIDE,TOTAL	MG/L : 15.1	P00940	CHLORIDE,TOTAL	MG/L : 275.
P00945	SULFATE,TOTAL	MG/L : 73.4	P00610	AMMONIA-N,TOTAL	MG/L : @CC
P32730	PHENOLS,TOTAL	UG/L : @MM	P00665	PHOSPHORUS-P,TOTAL	MG/L : @CC
P00720	CYANIDE,TOT	MG/L : @CC	P00076	TURBIDITY	NTU : 17
P71900	MERCURY,TOTAL	UG/L : 0.10K	P00916	CALCIUM,TOTAL	MG/L : 61.
P00927	MAGNESIUM,TOTAL	MG/L : 17.	P00929	SODIUM,TOTAL	MG/L : 260.
P00937	POTASSIUM,TOTAL	MG/L : 12.	P01105	ALUMINUM,TOTAL	UG/L : 5900
P01097	ANTIMONY,TOTAL	UG/L : 6K	P01002	ARSENIC,TOTAL	UG/L : 10K
P01007	BARIUM,TOTAL	UG/L : 140	P01022	BORON,TOTAL	UG/L : 1100
P01012	BERYLLIUM,TOTAL	UG/L : 1K	P01027	CADMIUM,TOTAL	UG/L : 5K
P01034	CHROMIUM,TOTAL	UG/L : 5K	P01042	COPPER,TOTAL	UG/L : 29
P01037	COBALT,TOTAL	UG/L : 5K	P01045	IRON,TOTAL	UG/L : 3800
P01051	LEAD,TOTAL	UG/L : 12	P01055	MANGANESE,TOTAL	UG/L : 300
P01067	NICKEL,TOTAL	UG/L : 34	P01147	SELENIUM,TOTAL	UG/L : 10K
P01077	SILVER,TOTAL	UG/L : 5K	P01082	STRONTIUM,TOTAL	UG/L : 220
P01059	THALLIUM,TOTAL (2)	UG/L : 10K	P01087	VANADIUM,TOTAL	UG/L : 14
P01092	ZINC,TOTAL	UG/L : 100K			

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903280
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S507
DATE COLLECTED : 990315 TIME COLLECTED : 1045 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403	PH-LABORATORY	UNITS :	8.3	P70300	(ROE) TDS @ 180C	MG/L :	827
P00951	FLUORIDE,TOTAL	MG/L :	12.4	P00940	CHLORIDE,TOTAL	MG/L :	200.
P00945	SULFATE,TOTAL	MG/L :	10K	P00610	AMMONIA-N,TOTAL	MG/L :	@CC
P32730	PHENOLS,TOTAL	UG/L :	@MM	P00665	PHOSPHORUS-P,TOTAL	MG/L :	@CC
P00720	CYANIDE,TOT	MG/L :	@CC	P00076	TURBIDITY	NTU :	19
P71900	MERCURY,TOTAL	UG/L :	0.10K	P00916	CALCIUM,TOTAL	MG/L :	59.
P00927	MAGNESIUM,TOTAL	MG/L :	16.	P00929	SODIUM,TOTAL	MG/L :	190.
P00937	POTASSIUM,TOTAL	MG/L :	9.5	P01105	ALUMINUM,TOTAL	UG/L :	5400
P01097	ANTIMONY,TOTAL	UG/L :	8	P01002	ARSENIC,TOTAL	UG/L :	10K
P01007	BARIUM,TOTAL	UG/L :	150	P01022	BORON,TOTAL	UG/L :	870
P01012	BERYLLIUM,TOTAL	UG/L :	1K	P01027	CADMIUM,TOTAL	UG/L :	5K
P01034	CHROMIUM,TOTAL	UG/L :	5K	P01042	COPPER,TOTAL	UG/L :	17
P01037	COBALT,TOTAL	UG/L :	5K	P01045	IRON,TOTAL	UG/L :	3600
P01051	LEAD,TOTAL	UG/L :	7	P01055	MANGANESE,TOTAL	UG/L :	330
P01067	NICKEL,TOTAL	UG/L :	14	P01147	SELENIUM,TOTAL	UG/L :	10K
P01077	SILVER,TOTAL	UG/L :	5K	P01082	STRONTIUM,TOTAL	UG/L :	200
P01059	THALLIUM,TOTAL (2)	UG/L :	10K	P01087	VANADIUM,TOTAL	UG/L :	13
P01092	ZINC,TOTAL	UG/L :	100K				

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903281
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : S508
DATE COLLECTED : 990316 TIME COLLECTED : 1145 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : DO UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

P00403	PH-LABORATORY	UNITS :	8.2	P70300	(ROE) TDS @ 180C	MG/L :	471
P00951	FLUORIDE,TOTAL	MG/L :	0.300	P00940	CHLORIDE,TOTAL	MG/L :	97.3
P00945	SULFATE,TOTAL	MG/L :	10K	P00610	AMMONIA-N,TOTAL	MG/L :	@CC
P32730	PHENOLS,TOTAL	UG/L :	@MM	P00665	PHOSPHORUS-P,TOTAL	MG/L :	@CC
P00720	CYANIDE,TOT	MG/L :	@CC	P00076	TURBIDITY	NTU :	20
P71900	MERCURY,TOTAL	UG/L :	0.10K	P00916	CALCIUM,TOTAL	MG/L :	78.
P00927	MAGNESIUM,TOTAL	MG/L :	17.	P00929	SODIUM,TOTAL	MG/L :	47.
P00937	POTASSIUM,TOTAL	MG/L :	6.7	P01105	ALUMINUM,TOTAL	UG/L :	150
P01097	ANTIMONY,TOTAL	UG/L :	6K	P01002	ARSENIC,TOTAL	UG/L :	10K
P01007	BARIUM,TOTAL	UG/L :	93	P01022	BORON,TOTAL	UG/L :	130
P01012	BERYLLIUM,TOTAL	UG/L :	1K	P01027	CADMIUM,TOTAL	UG/L :	5K
P01034	CHROMIUM,TOTAL	UG/L :	5K	P01042	COPPER,TOTAL	UG/L :	44
P01037	COBALT,TOTAL	UG/L :	5K	P01045	IRON,TOTAL	UG/L :	190
P01051	LEAD,TOTAL	UG/L :	5	P01055	MANGANESE,TOTAL	UG/L :	24
P01067	NICKEL,TOTAL	UG/L :	5K	P01147	SELENIUM,TOTAL	UG/L :	10K
P01077	SILVER,TOTAL	UG/L :	5K	P01082	STRONTIUM,TOTAL	UG/L :	230
P01059	THALLIUM,TOTAL (2)	UG/L :	10K	P01087	VANADIUM,TOTAL	UG/L :	5K
P01092	ZINC,TOTAL	UG/L :	110				

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903265
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CTY

SUBMITTING SOURCE # : 1190000000 SITE # : X101
DATE COLLECTED : 990316 TIME COLLECTED : 1125 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT	UNITS : 4.4	A10000	PH,SW846 MET 9045	UNITS : 7.5
P79693	PHENOLS,SW846	MG/KG : 0.58K	P79595	CYANIDE,SW84 D/WT	MG/KG : 0.58K
P81951	CARBON,ORG(TOC)	MG/KG : 41000	P70318	SOLIDS,% WET SAMPL	% : 85.42
P49134	MERCURY,TCLP SLD	MG/L : 0.001K	P99023	MERCURY,SW84 D/WT	MG/KG : 0.10K
P49100	ANTIMONY,TCLP SLD	MG/L : .006K	P49099	ARSENIC,TCLP SLD	MG/L : .030
P49101	BARIUM,TCLP SLD	MG/L : .380	P49102	BERYLLIUM,TCLP SLD	MG/L : .004
P49103	CADMIUM,TCLP SLD	MG/L : .090	P49105	CHROMIUM,TCLP SLD	MG/L : .005K
P49109	LEAD,TCLP SLD	MG/L : .090	P49112	NICKEL,TCLP SLD	MG/L : .150
P49114	SELENIUM,TCLP SLD	MG/L : .010K	P49115	SILVER,TCLP SLD	MG/L : .005K
P49118	THALLIUM,TCLP SLD	MG/L : .010K	P49119	VANADIUM,TCLP SLD	MG/L : .016
P79581	CALCIUM,SW84 D/WT	MG/KG : 4400	P79650	MAGNESIUM,SW D/WT	MG/KG : 2700
P79705	SODIUM,SW846 D/WT	MG/KG : 1900	P00937	POTASSIUM,SW D/WT	MG/KG : 1800
P97545	ALUMINUM,SW8 D/WT	MG/KG : 11000	P79547	ANTIMONY,SW8 D/WT	MG/KG : 1.4K
P79548	ARSENIC,SW84 D/WT	MG/KG : 3.4	P79550	BARIUM,SW846 D/WT	MG/KG : 160
P78463	BORON,SW846 D/WT	MG/KG : 17	P79556	BERYLLIUM,SW D/WT	MG/KG : 0.8
P79580	CADMIUM,SW84 D/WT	MG/KG : 11	P79591	CHROMIUM,SW8 D/WT	MG/KG : 15
P79594	COPPER,SW846 D/WT	MG/KG : 76	P79593	COBALT,SW846 D/WT	MG/KG : 3.7
P79645	IRON,SW846 D/WT	MG/KG : 11000	P79649	LEAD,SW846 D/WT	MG/KG : 62
P79651	MANGANESE,SW D/WT	MG/KG : 130	P79671	NICKEL,SW846 D/WT	MG/KG : 58
P79703	SELENIUM,SW8 D/WT	MG/KG : 2.3K	P79704	SILVER,SW846 D/WT	MG/KG : 1.2K
P79706	STRONTIUM,SW D/WT	MG/KG : 25	P79712	THALLIUM,SW8 D/WT	MG/KG : 2.3K
P79722	VANADIUM,SW8 D/WT	MG/KG : 26	P79726	ZINC,SW846 D/WT	MG/KG : 250

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903266
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X102
DATE COLLECTED : 990316 TIME COLLECTED : 1435 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT	UNITS :	4.4	A10000	PH,SW846 MET 9045	UNITS :	7.1
P79693	PHENOLS,SW846	MG/KG :	0.59K	P79595	CYANIDE,SW84 D/WT	MG/KG :	0.59K
P81951	CARBON,ORG(TOC)	MG/KG :	76000	P70318	SOLIDS,% WET SAMPL	% :	84.17
P49134	MERCURY,TCLP SLD	MG/L :	0.001K	P99023	MERCURY,SW84 D/WT	MG/KG :	0.10K
P49100	ANTIMONY,TCLP SLD	MG/L :	.006K	P49099	ARSENIC,TCLP SLD	MG/L :	.048
P49101	BARIUM,TCLP SLD	MG/L :	.730	P49102	BERYLLIUM,TCLP SLD	MG/L :	.004
P49103	CADMIUM,TCLP SLD	MG/L :	.130	P49105	CHROMIUM,TCLP SLD	MG/L :	.005K
P49107	LEAD,TCLP SLD	MG/L :	.250	P49112	NICKEL,TCLP SLD	MG/L :	.180
P49114	SELENIUM,TCLP SLD	MG/L :	.010K	P49115	SILVER,TCLP SLD	MG/L :	.005K
P49118	THALLIUM,TCLP SLD	MG/L :	.010K	P49119	VANADIUM,TCLP SLD	MG/L :	.010
P79581	CALCIUM,SW84 D/WT	MG/KG :	4000	P79650	MAGNESIUM,SW D/WT	MG/KG :	2800
P79705	SODIUM,SW846 D/WT	MG/KG :	1200	P00937	POTASSIUM,SW D/WT	MG/KG :	1900
P97545	ALUMINUM,SW8 D/WT	MG/KG :	11000	P79547	ANTIMONY,SW8 D/WT	MG/KG :	1K
P79548	ARSENIC,SW84 D/WT	MG/KG :	2.9	P79550	BARIUM,SW846 D/WT	MG/KG :	150
P78463	BORON,SW846 D/WT	MG/KG :	16	P79556	BERYLLIUM,SW D/WT	MG/KG :	0.8
P79580	CADMIUM,SW84 D/WT	MG/KG :	7.6	P79591	CHROMIUM,SW8 D/WT	MG/KG :	14
P79594	COPPER,SW846 D/WT	MG/KG :	75	P79593	COBALT,SW846 D/WT	MG/KG :	3.3
P79645	IRON,SW846 D/WT	MG/KG :	12000	P79649	LEAD,SW846 D/WT	MG/KG :	77
P79651	MANGANESE,SW D/WT	MG/KG :	150	P79671	NICKEL,SW846 D/WT	MG/KG :	44
P79703	SELENIUM,SW8 D/WT	MG/KG :	1.6K	P79704	SILVER,SW846 D/WT	MG/KG :	0.8K
P79706	STRONTIUM,SW D/WT	MG/KG :	25	P79712	THALLIUM,SW8 D/WT	MG/KG :	1.6K
P79722	VANADIUM,SW8 D/WT	MG/KG :	25	P79726	ZINC,SW846 D/WT	MG/KG :	210

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903267
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X103
DATE COLLECTED : 990316 TIME COLLECTED : 1025 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT	UNITS :	4.5	A10000	PH,SW846 MET 9045	UNITS :	7.1
P79693	PHENOLS,SW846	MG/KG :	0.57K	P79595	CYANIDE,SW84 D/WT	MG/KG :	0.57K
P81951	CARBON,ORG(TOC)	MG/KG :	46000	P70318	SOLIDS,% WET SAMPL	% :	88.32
P49134	MERCURY,TCLP SLD	MG/L :	0.001K	P99023	MERCURY,SW84 D/WT	MG/KG :	0.10K
P49100	ANTIMONY,TCLP SLD	MG/L :	.006K	P49099	ARSENIC,TCLP SLD	MG/L :	.026
P49101	BARIUM,TCLP SLD	MG/L :	.900	P49102	BERYLLIUM,TCLP SLD	MG/L :	.004
P49103	CADMIUM,TCLP SLD	MG/L :	.110	P49105	CHROMIUM,TCLP SLD	MG/L :	.005K
P49109	LEAD,TCLP SLD	MG/L :	.043	P49112	NICKEL,TCLP SLD	MG/L :	.220
P49114	SELENIUM,TCLP SLD	MG/L :	.010K	P49115	SILVER,TCLP SLD	MG/L :	.005K
P49118	THALLIUM,TCLP SLD	MG/L :	.010K	P49119	VANADIUM,TCLP SLD	MG/L :	.009
P79581	CALCIUM,SW84 D/WT	MG/KG :	3700	P79650	MAGNESIUM,SW D/WT	MG/KG :	2700
P79705	SODIUM,SW846 D/WT	MG/KG :	1400	P00937	POTASSIUM,SW D/WT	MG/KG :	1900
P97545	ALUMINUM,SW8 D/WT	MG/KG :	9800	P79547	ANTIMONY,SW8 D/WT	MG/KG :	1.2K
P79548	ARSENIC,SW84 D/WT	MG/KG :	5.4	P79550	BARIUM,SW846 D/WT	MG/KG :	190
P78463	BORON,SW846 D/WT	MG/KG :	15	P79556	BERYLLIUM,SW D/WT	MG/KG :	0.7
P79580	CADMIUM,SW84 D/WT	MG/KG :	18	P79591	CHROMIUM,SW8 D/WT	MG/KG :	13
P79594	COPPER,SW846 D/WT	MG/KG :	50	P79593	COBALT,SW846 D/WT	MG/KG :	5
P79645	IRON,SW846 D/WT	MG/KG :	12000	P79649	LEAD,SW846 D/WT	MG/KG :	35
P79651	MANGANESE,SW D/WT	MG/KG :	170	P79671	NICKEL,SW846 D/WT	MG/KG :	40
P79703	SELENIUM,SW8 D/WT	MG/KG :	2K	P79704	SILVER,SW846 D/WT	MG/KG :	1K
P79706	STRONTIUM,SW D/WT	MG/KG :	25	P79712	THALLIUM,SW8 D/WT	MG/KG :	2K
P79722	VANADIUM,SW8 D/WT	MG/KG :	23	P79726	ZINC,SW846 D/WT	MG/KG :	280

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903268
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X104
DATE COLLECTED : 990316 TIME COLLECTED : 1005 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT	UNITS :	4.5	A10000	PH,SW846 MET 9045	UNITS :	7.4
P79693	PHENOLS,SW846	MG/KG :	0.54K	P79595	CYANIDE,SW84 D/WT	MG/KG :	0.54K
P81951	CARBON,ORG(TOC)	MG/KG :	27000	P70318	SOLIDS,% WET SAMPL	% :	92.43
P49134	MERCURY,TCLP SLD	MG/L :	0.001K	P99023	MERCURY,SW84 D/WT	MG/KG :	0.10K
P49100	ANTIMONY,TCLP SLD	MG/L :	.006K	P49099	ARSENIC,TCLP SLD	MG/L :	.010K
P49101	BARIUM,TCLP SLD	MG/L :	.810	P49102	BERYLLIUM,TCLP SLD	MG/L :	.002
P49103	CADMIUM,TCLP SLD	MG/L :	.024	P49105	CHROMIUM,TCLP SLD	MG/L :	.005K
P49109	LEAD,TCLP SLD	MG/L :	.037	P49112	NICKEL,TCLP SLD	MG/L :	.130
P49114	SELENIUM,TCLP SLD	MG/L :	.010K	P49115	SILVER,TCLP SLD	MG/L :	.005K
P49118	THALLIUM,TCLP SLD	MG/L :	.010K	P49119	VANADIUM,TCLP SLD	MG/L :	.005K
P79581	CALCIUM,SW84 D/WT	MG/KG :	4400	P79650	MAGNESIUM,SW D/WT	MG/KG :	3000
P79705	SODIUM,SW846 D/WT	MG/KG :	920	P00937	POTASSIUM,SW D/WT	MG/KG :	2000
P97545	ALUMINUM,SW8 D/WT	MG/KG :	11000	P79547	ANTIMONY,SW8 D/WT	MG/KG :	1.3K
P79548	ARSENIC,SW84 D/WT	MG/KG :	5.6	P79550	BARIUM,SW846 D/WT	MG/KG :	270
P78463	BORON,SW846 D/WT	MG/KG :	10	P79556	BERYLLIUM,SW D/WT	MG/KG :	0.8
P79580	CADMIUM,SW84 D/WT	MG/KG :	3.4	P79591	CHROMIUM,SW8 D/WT	MG/KG :	14
P79594	COPPER,SW846 D/WT	MG/KG :	25	P79593	COBALT,SW846 D/WT	MG/KG :	5.3
P79645	IRON,SW846 D/WT	MG/KG :	14000	P79649	LEAD,SW846 D/WT	MG/KG :	34
P79651	MANGANESE,SW D/WT	MG/KG :	220	P79671	NICKEL,SW846 D/WT	MG/KG :	29
P79703	SELENIUM,SW8 D/WT	MG/KG :	2.1K	P79704	SILVER,SW846 D/WT	MG/KG :	1.1K
P79706	STRONTIUM,SW D/WT	MG/KG :	50	P79712	THALLIUM,SW8 D/WT	MG/KG :	2.1K
P79722	VANADIUM,SW8 D/WT	MG/KG :	26	P79726	ZINC,SW846 D/WT	MG/KG :	180

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903269
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X105
DATE COLLECTED : 990316 TIME COLLECTED : 0950 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT UNITS	4.5	A10000	PH,SW846 MET 9045 UNITS	5.6
P79693	PHENOLS,SW846 MG/KG	0.55K	P79595	CYANIDE,SW84 D/WT MG/KG	0.55K
P81951	CARBON,ORG(TOC) MG/KG	56000	P70318	SOLIDS,% WET SAMPL %	91.01
P49134	MERCURY,TCLP SLD MG/L	0.001K	P99023	MERCURY,SW84 D/WT MG/KG	0.10K
P49100	ANTIMONY,TCLP SLD MG/L	.006K	P49099	ARSENIC,TCLP SLD MG/L	.034
P49101	BARIUM,TCLP SLD MG/L	.860	P49102	BERYLLIUM,TCLP SLD MG/L	.003
P49103	CADMIUM,TCLP SLD MG/L	.400	P49105	CHROMIUM,TCLP SLD MG/L	.005K
P49109	LEAD,TCLP SLD MG/L	.110	P49112	NICKEL,TCLP SLD MG/L	.280
P49114	SELENIUM,TCLP SLD MG/L	.010K	P49115	SILVER,TCLP SLD MG/L	.005K
P49118	THALLIUM,TCLP SLD MG/L	.010K	P49119	VANADIUM,TCLP SLD MG/L	.005K
P79581	CALCIUM,SW84 D/WT MG/KG	3600	P79650	MAGNESIUM,SW D/WT MG/KG	3000
P79705	SODIUM,SW846 D/WT MG/KG	950	P00937	POTASSIUM,SW D/WT MG/KG	2100
P97545	ALUMINUM,SW8 D/WT MG/KG	12000	P79547	ANTIMONY,SW8 D/WT MG/KG	1.2K
P79548	ARSENIC,SW84 D/WT MG/KG	4.9	P79550	BARIUM,SW846 D/WT MG/KG	130
P78463	BORON,SW846 D/WT MG/KG	15	P79556	BERYLLIUM,SW D/WT MG/KG	0.7
P79580	CADMIUM,SW84 D/WT MG/KG	58	P79591	CHROMIUM,SW8 D/WT MG/KG	15
P79594	COPPER,SW846 D/WT MG/KG	150	P79593	COBALT,SW846 D/WT MG/KG	4.1
P79645	IRON,SW846 D/WT MG/KG	14000	P79649	LEAD,SW846 D/WT MG/KG	71
P79651	MANGANESE,SW D/WT MG/KG	140	P79671	NICKEL,SW846 D/WT MG/KG	58
P79703	SELENIUM,SW8 D/WT MG/KG	1.9K	P79704	SILVER,SW846 D/WT MG/KG	1K
P79706	STRONTIUM,SW D/WT MG/KG	22	P79712	THALLIUM,SW8 D/WT MG/KG	1.9K
P79722	VANADIUM,SW8 D/WT MG/KG	29	P79726	ZINC,SW846 D/WT MG/KG	390

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903271
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X107
DATE COLLECTED : 990315 TIME COLLECTED : 1045 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT	UNITS	4.4	A10000	PH,SW846 MET 9045	UNITS	7.0
P79693	PHENOLS,SW846	MG/KG	0.57K	P79595	CYANIDE,SW84 D/WT	MG/KG	0.57K
P81951	CARBON,ORG(TOC)	MG/KG	35000	P70318	SOLIDS,% WET SAMPL	%	88.08
P49134	MERCURY,TCLP SLD	MG/L	0.001K	P99023	MERCURY,SW84 D/WT	MG/KG	0.10K
P49100	ANTIMONY,TCLP SLD	MG/L	.007	P49099	ARSENIC,TCLP SLD	MG/L	.067
P49101	BARIUM,TCLP SLD	MG/L	1.2	P49102	BERYLLIUM,TCLP SLD	MG/L	.002
P49103	CADMIUM,TCLP SLD	MG/L	.028	P49105	CHROMIUM,TCLP SLD	MG/L	.005K
P49109	LEAD,TCLP SLD	MG/L	.042	P49112	NICKEL,TCLP SLD	MG/L	.280
P49114	SELENIUM,TCLP SLD	MG/L	.010K	P49115	SILVER,TCLP SLD	MG/L	.005K
P49118	THALLIUM,TCLP SLD	MG/L	.010K	P49119	VANADIUM,TCLP SLD	MG/L	.022
P79581	CALCIUM,SW84 D/WT	MG/KG	4200	P79650	MAGNESIUM,SW D/WT	MG/KG	2600
P79705	SODIUM,SW846 D/WT	MG/KG	340	P00937	POTASSIUM,SW D/WT	MG/KG	1500
P97545	ALUMINUM,SW8 D/WT	MG/KG	8600	P79547	ANTIMONY,SW8 D/WT	MG/KG	1K
P79548	ARSENIC,SW84 D/WT	MG/KG	4.6	P79550	BARIUM,SW846 D/WT	MG/KG	140
P78463	BORON,SW846 D/WT	MG/KG	7.4	P79556	BERYLLIUM,SW D/WT	MG/KG	0.6
P79580	CADMIUM,SW84 D/WT	MG/KG	12	P79591	CHROMIUM,SW8 D/WT	MG/KG	11
P79594	COPPER,SW846 D/WT	MG/KG	53	P79593	COBALT,SW846 D/WT	MG/KG	5.6
P79645	IRON,SW846 D/WT	MG/KG	12000	P79649	LEAD,SW846 D/WT	MG/KG	30
P79651	MANGANESE,SW D/WT	MG/KG	240	P79671	NICKEL,SW846 D/WT	MG/KG	50
P79703	SELENIUM,SW8 D/WT	MG/KG	1.7K	P79704	SILVER,SW846 D/WT	MG/KG	0.9K
P79706	STRONTIUM,SW D/WT	MG/KG	21	P79712	THALLIUM,SW8 D/WT	MG/KG	1.7K
P79722	VANADIUM,SW8 D/WT	MG/KG	21	P79726	ZINC,SW846 D/WT	MG/KG	220

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903272
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X103
DATE COLLECTED : 990316 TIME COLLECTED : 1145 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT	UNITS	4.4	A10000	PH,SW846 MET 9045	UNITS	6.7
P79693	PHENOLS,SW846	MG/KG	0.56K	P79595	CYANIDE,SW84 D/WT	MG/KG	0.56K
P81951	CARBON,ORG(TOC)	MG/KG	35000	P70318	SOLIDS,% WET SAMPL	%	88.46
P49134	MERCURY,TCLP SLD	MG/L	0.001K	P99023	MERCURY,SW84 D/WT	MG/KG	0.10K
P49100	ANTIMONY,TCLP SLD	MG/L	.006K	P49099	ARSENIC,TCLP SLD	MG/L	.093
P49101	BARIUM,TCLP SLD	MG/L	1.4	P49102	BERYLLIUM,TCLP SLD	MG/L	.003
P49103	CADMIUM,TCLP SLD	MG/L	.043	P49105	CHROMIUM,TCLP SLD	MG/L	.005K
P49109	LEAD,TCLP SLD	MG/L	.240	P49112	NICKEL,TCLP SLD	MG/L	.110
P49114	SELENIUM,TCLP SLD	MG/L	.010K	P49115	SILVER,TCLP SLD	MG/L	.005K
P49118	THALLIUM,TCLP SLD	MG/L	.010K	P49119	VANADIUM,TCLP SLD	MG/L	.008
P79581	CALCIUM,SW84 D/WT	MG/KG	4400	P79650	MAGNESIUM,SW D/WT	MG/KG	3000
P79705	SODIUM,SW846 D/WT	MG/KG	190	P00937	POTASSIUM,SW D/WT	MG/KG	1800
P97545	ALUMINUM,SW8 D/WT	MG/KG	8900	P79547	ANTIMONY,SW8 D/WT	MG/KG	1.3K
P79548	ARSENIC,SW84 D/WT	MG/KG	4.3	P79550	BARIUM,SW846 D/WT	MG/KG	170
P78463	BORON,SW846 D/WT	MG/KG	8.4	P79556	BERYLLIUM,SW D/WT	MG/KG	0.6
P79580	CADMIUM,SW84 D/WT	MG/KG	2.0	P79591	CHROMIUM,SW8 D/WT	MG/KG	12
P79594	COPPER,SW846 D/WT	MG/KG	92	P79593	COBALT,SW846 D/WT	MG/KG	5.2
P79645	IRON,SW846 D/WT	MG/KG	13000	P79649	LEAD,SW846 D/WT	MG/KG	62
P79651	MANGANESE,SW D/WT	MG/KG	290	P79671	NICKEL,SW846 D/WT	MG/KG	19
P79703	SELENIUM,SW8 D/WT	MG/KG	2.1K	P79704	SILVER,SW846 D/WT	MG/KG	1.1K
P79706	STRONTIUM,SW D/WT	MG/KG	25	P79712	THALLIUM,SW8 D/WT	MG/KG	2.1K
P79722	VANADIUM,SW8 D/WT	MG/KG	22	P79726	ZINC,SW846 D/WT	MG/KG	210

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903270
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X106
DATE COLLECTED : 990315 TIME COLLECTED : 1100 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT	UNITS :	4.4	A10000	PH,SW846 MET 9045	UNITS :	6.9
P79693	PHENOLS,SW846	MG/KG :	0.56K	P79595	CYANIDE,SW84 D/WT	MG/KG :	0.893
P81951	CARBON,ORG(TOC)	MG/KG :	40000	P70318	SOLIDS,% WET SAMPL	% :	89.29
P49134	MERCURY,TCLP SLD	MG/L :	0.001K	P99023	MERCURY,SW84 D/WT	MG/KG :	0.10K
P49100	ANTIMONY,TCLP SLD	MG/L :	.006K	P49099	ARSENIC,TCLP SLD	MG/L :	.070
P49101	BARIUM,TCLP SLD	MG/L :	.950	P49102	BERYLLIUM,TCLP SLD	MG/L :	.002
P49103	CADMIUM,TCLP SLD	MG/L :	.100	P49105	CHROMIUM,TCLP SLD	MG/L :	.005K
P49109	LEAD,TCLP SLD	MG/L :	.057	P49112	NICKEL,TCLP SLD	MG/L :	.280
P49114	SELENIUM,TCLP SLD	MG/L :	.010K	P49115	SILVER,TCLP SLD	MG/L :	.005K
P49118	THALLIUM,TCLP SLD	MG/L :	.010K	P49119	VANADIUM,TCLP SLD	MG/L :	.017
P79581	CALCIUM,SW84 D/WT	MG/KG :	4000	P79650	MAGNESIUM,SW D/WT	MG/KG :	2600
P79705	SODIUM,SW846 D/WT	MG/KG :	550	P00937	POTASSIUM,SW D/WT	MG/KG :	1700
P97545	ALUMINUM,SW8 D/WT	MG/KG :	10000	P79547	ANTIMONY,SW8 D/WT	MG/KG :	1.3K
P79548	ARSENIC,SW84 D/WT	MG/KG :	3.6	P79550	BARIUM,SW846 D/WT	MG/KG :	140
P78463	BORON,SW846 D/WT	MG/KG :	8.9	P79556	BERYLLIUM,SW D/WT	MG/KG :	0.7
P79580	CADMIUM,SW84 D/WT	MG/KG :	19	P79591	CHROMIUM,SW8 D/WT	MG/KG :	12
P79594	COPPER,SW846 D/WT	MG/KG :	84	P79593	COBALT,SW846 D/WT	MG/KG :	5.0
P79645	IRON,SW846 D/WT	MG/KG :	13000	P79649	LEAD,SW846 D/WT	MG/KG :	42
P79651	MANGANESE,SW D/WT	MG/KG :	230	P79671	NICKEL,SW846 D/WT	MG/KG :	71
P79703	SELENIUM,SW8 D/WT	MG/KG :	2.2K	P79704	SILVER,SW846 D/WT	MG/KG :	1.1K
P79706	STRONTIUM,SW D/WT	MG/KG :	22	P79712	THALLIUM,SW8 D/WT	MG/KG :	2.2K
P79722	VANADIUM,SW8 D/WT	MG/KG :	22	P79726	ZINC,SW846 D/WT	MG/KG :	300

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NUMBER : B903273
SAMPLING POINT DESC. : MITCHELL LONG LAKE, MADISON CNTY

SUBMITTING SOURCE # : 1190000000 SITE # : X201
DATE COLLECTED : 990315 TIME COLLECTED : 1110 SAMPLING PROGRAM :

COLLECTED BY : CNC DELIVERED BY : UPS
COMMENTS :
FUNDING CODE : LP41 AGENCY ROUTING : 00 UNIT CODE :
SAM TYPE CODE : SAMPLE PURPOSE CODE : F REPORTING INDICATOR : B

DATE RECEIVED : 990317 TIME RECEIVED : 0900 RECEIVED BY : LPD
LAB OBSERVATIONS : TRIP BL SAM# :
SUPERVISORS INITIALS : SMM NOTE : K = LESS THAN VALUE

A10000	PH,FINAL TCLP EXT UNITS	4.8	P79693	PHENOLS,SW846	MG/KG : 0.51K
P79595	CYANIDE,SW84 D/WT	MG/KG : 0.51K	P81951	CARBON,ORG(TOC)	MG/KG : 21000
P70318	SOLIDS,% WET SAMPL	% : 98.54	P49134	MERCURY,TCLP SLD	MG/L : 0.001K
P99023	MERCURY,SW84 D/WT	MG/KG : 0.10K	P49100	ANTIMONY,TCLP SLD	MG/L : .006K
P49099	ARSENIC,TCLP SLD	MG/L : .010K	P49101	BARIUM,TCLP SLD	MG/L : 2.0
P49102	BERYLLIUM,TCLP SLD	MG/L : .057	P49103	CADMIUM,TCLP SLD	MG/L : .270
P49105	CHROMIUM,TCLP SLD	MG/L : .035	P49109	LEAD,TCLP SLD	MG/L : 14.
P49112	NICKEL,TCLP SLD	MG/L : .610	P49114	SELENIUM,TCLP SLD	MG/L : .010K
P49115	SILVER,TCLP SLD	MG/L : .005K	P49118	THALLIUM,TCLP SLD	MG/L : .010K
P49119	VANADIUM,TCLP SLD	MG/L : .005K	P79581	CALCIUM,SW84 D/WT	MG/KG : 19000
P79650	MAGNESIUM,SW D/WT	MG/KG : 6600	P79705	SODIUM,SW846 D/WT	MG/KG : 510
P00937	POTASSIUM,SW D/WT	MG/KG : 1400	P97545	ALUMINUM,SW8 D/WT	MG/KG : 11000
P79547	ANTIMONY,SW8 D/WT	MG/KG : 5.5K	P79548	ARSENIC,SW84 D/WT	MG/KG : 9.2K
P79550	BARIUM,SW846 D/WT	MG/KG : 240	P78463	BORON,SW846 D/WT	MG/KG : 51
P79556	BERYLLIUM,SW D/WT	MG/KG : 18	P79580	CADMIUM,SW84 D/WT	MG/KG : 7.9
P79591	CHROMIUM,SW8 D/WT	MG/KG : 72	P79594	COPPER,SW846 D/WT	MG/KG : 1600
P79593	COBALT,SW846 D/WT	MG/KG : 68	P79645	IRON,SW846 D/WT	MG/KG : 120000
P79649	LEAD,SW846 D/WT	MG/KG : 2900	P79651	MANGANESE,SW D/WT	MG/KG : 1400
P79671	NICKEL,SW846 D/WT	MG/KG : 370	P79703	SELENIUM,SW8 D/WT	MG/KG : 9.2K
P79704	SILVER,SW846 D/WT	MG/KG : 4.6K	P79706	STRONTIUM,SW D/WT	MG/KG : 45
P79712	THALLIUM,SW8 D/WT	MG/KG : 9.2K	P79722	VANADIUM,SW8 D/WT	MG/KG : 32
P79726	ZINC,SW846 D/WT	MG/KG : 34000			

APPENDIX E

SITE-SPECIFIC SAMPLING AND ANALYSIS PLAN
SEDIMENT AND SURFACE WATER
LONG LAKE - MITCHELL, ILLINOIS

BY:

CHRIS CAHNOVSKY
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
REGION 6 - FIELD OPERATIONS SECTION
BUREAU OF LAND
2009 MALL STREET
COLLINSVILLE, ILLINOIS 62234
MARCH 1999

TABLE OF CONTENTS

SITE-SPECIFIC SAMPLING AND ANALYSIS PLAN
SEDIMENT AND SURFACE WATER
LONG LAKE - MITCHELL, ILLINOIS

1.0 INTRODUCTION

The following constitutes a Site-Specific Field Sampling and Analysis Plan (SAP) for surface water and sediment in Long Lake Mitchell, Illinois. On September 18, 1996, the Agency discovered that Chemetco, Inc. was discharging zinc oxide slurry to Long Lake. Samples taken by the Agency on that date showed that the zinc oxide slurry was characteristically hazardous for lead and cadmium. The zinc oxide slurry also contained other heavy metals, such as copper and zinc, and had an elevated pH.

Chemetco responded to this discharge by impounding an impacted section of Long Lake under an Army Corp. of Engineers 404 Permit pursuant to the Clean Water Act. According to Chemetco, the approximate area of the release was 300 feet long by 450 feet wide. Chemetco constructed four Containment Areas (Figure 1-1). The impounded section of Long Lake, Containment Area 3, was pumped dry and zinc oxide, vegetation and contaminated soil were removed and place in Containment Area #1. According to Chemetco, Containment Area 1 contains about 1,500 cubic yards of zinc oxide. The water from the impounded portion Long Lake was pumped to Containment Area 2. Containment Area 2 contains about 575,000 gallons of water.

On November 17, 1997, Chemetco submitted a plan titled Zinc Oxide Spill Remediation Plan Phase I - Material Removal and Partial Closure. This plan was not approved by the Agency. Chemetco submitted a revised plan in April 1998. This plan was approved by the Agency with conditions. However, Chemetco appealed this approval to the Illinois Pollution Control Board. As of October 22, 1998, Chemecto has not removed any waste zinc oxide from the release area for proper disposal.

In May 1998, the United States Environmental Protection Agency and the Illinois Environmental Protection Agency sampled the surface water and sediment of Long Lake outside the portion of Long Lake that Chemetco impounded. The USEPA found that the sediments in Long Lake contained high levels of lead and cadmium when compared to background soil samples. Sediment samples contained a mean lead concentration of 712 mg/kg that is 10 times greater than the mean soil background concentration taken at the facility. All USEPA sediment samples are near or above the 400 mg/kg IEPA Tier I Industrial soil clean up objective level for lead. The USEPA found that the surface water contained no notable concentrations of metals. All samples taken during the May 1998 sampling event were taken on Chemetco's property.

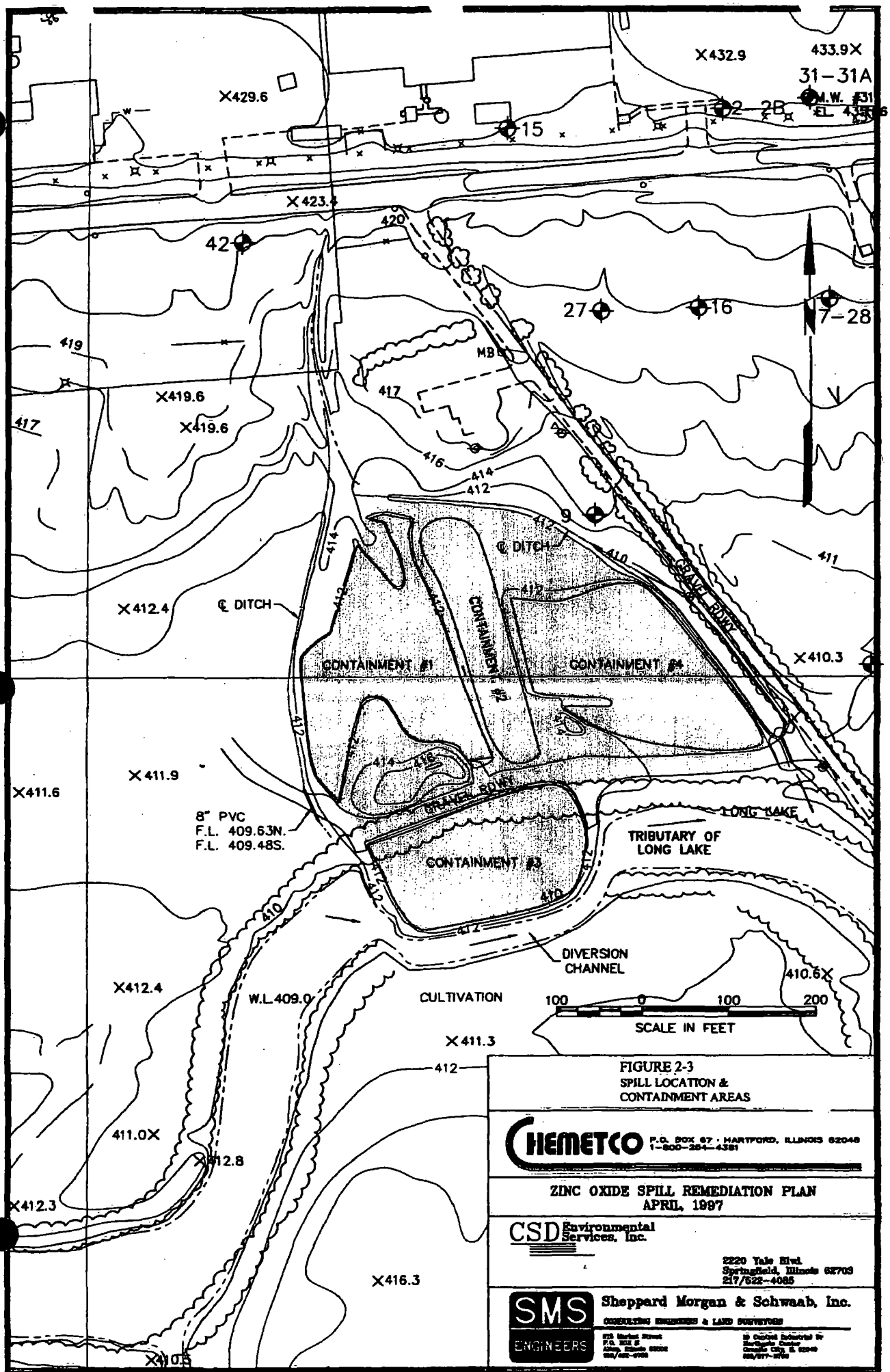


FIGURE 2-3
SPILL LOCATION &
CONTAINMENT AREAS

CHEMETCO P.O. BOX 67 ; HARTFORD, ILLINOIS 62048
1-800-254-4381

ZINC OXIDE SPILL REMEDIATION PLAN
APRIL, 1997

CSD Environmental Services, Inc.
2220 Yale Blvd.
Springfield, Illinois 62703
217/522-4085

SMS ENGINEERS
Sheppard Morgan & Schwaab, Inc.
CONSULTING ENGINEERS & LAND SURVEYORS

2.0 PURPOSE AND OBJECTIVE

This SAP has been prepared to allow for the collection and analysis of surface water and sediment samples from Long Lake. These samples will be collected for determining if the water and sediment in the Mitchell area of Long Lake have been affected by the release of zinc oxide slurry from the Chemetco facility. Samples will be taken from Long Lake on the west side of Illinois State Route 3 and from a 10,000 foot (1.89 mile) section of Long Lake starting at Chemetco's property line extending to Franko Lane.

3.0 SITE DESCRIPTION

Long Lake is a long narrow body of water that extends from the Mississippi River side of the levee in Hartford, Illinois to an area south of Pontoon Beach. Portions of Long Lake are considered Lacustrine Systems. Lacustrine Systems are usually made up of wetlands and deepwater habitats with all of the following characteristics: (1) within topographic depression or a dammed river channel; (2) lacking trees, shrubs and persistent emergents and; (3) total area exceeds 20 acres. Lacustrine Systems include permanently flooded lakes and reservoirs. Portions of Long Lake are also considered Palustrine Systems. Palustrine Systems includes all non-tidal wetlands dominated by trees, shrubs and persistent emergents. Palustrine Systems also include wetlands lacking such vegetation, but all of the following characteristics: (1) less than 20 acres; (2) active wave-formed or bedrock shoreline features lacking; and (3) water depth in the deepest part of the basin less than 6.6 feet at low water[1]. The portions of Long Lake being sampled under this SAP are primarily Palustrine Systems with intermittent water with depths of seven feet or less.

The area sampled under this SAP includes a portion of Long Lake from near Chemetco's property line to a Franko Lane in unicorporated Madison County, known as Mitchell, Illinois. Also, a small area of Long Lake on the north side of Illinois Route 3 will be sampled. This area was selected because the lake is intermittent and some portions only have water during seasonal flooding. Also, the fill used to construct the field road through the lake is made of secondary copper smelting slag. This type of slag has been found to leach lead and other heavy metals. The slag and sediments surrounding the slag road will be sampled as part of this SAP.

The study area south of the release area is about a 10,000 foot (1.89 miles) section of the lake. The property surrounding the lake is owned by Union Colliery, also known as Ameren UE. The Agency has obtained permission from Ameren UE to access the lake from Union Calliery's property. The area of the lake from Chemetco's property to the first home is about 3,600 feet long. This area is forested and only seasonally flooded[2]. The next approximately 800 feet of Long Lake is open water with an unconsolidated bottom. The next approximately 2,000 feet is predominantly dry or with less than two feet of water but susceptible to seasonal flooding. The remaining approximately 3,600 feet of Long Lake to Franko Lane is open water with an unconsolidated bottom. An unconsolidated bottom is made up of cobble-gravel, sand mud and organic matter.

4.0 SURFACE WATER AND SEDIMENT SAMPLING

Surface water and co-located sediment samples will be collected to determine if there has been a release of any hazardous constituents to the Mitchell portion of Long Lake. One sample will be taken north of Illinois State Route 3 and seven samples will be taken starting at the edge of Chemetco's property line and continuing to just north of Franko Lane. Sample locations are shown on Figures 4-1, 4-2 and 4-3. This area was selected due to the intermittent nature of Long Lake from Chemetco's property line to the field road and the proximetly of residences to the lake. A summary of the analytical methods is presented in Table 7-1.

It is anticipated that eight surface water and co-located sediment samples will be taken. Sample locations may change based on field conditions. The sediment samples will be given the field sample numbers of X101-X108 and the surface water samples will be assigned the field sample numbers of S501-S508. The sampling team will follow the sampling procedures outlined in the Bureau of Land Sampling Procedures Guidance Manual, September 1996. Specifically, Section IX Surface Water and Section X Sediment will be followed. These Sections are included as Appendix A.

Surface water samples will be taken by submerging a clean plastic quart container directly into the surface water. The sample will then be transferred into the sampling container. A clean jug will be used for each sample. For those areas that are accessible only from a distance, the sample will be collected using a clean plastic quart jug attached to an extendable pole. The surface water samples will be analyzed for pH, fluoride, sulfate, total dissolved solids, chloride, turbidity, mercury, magnesium, potassium, antimony, barium, beryllium, chromium, coblat, lead, nickel, silver, thallium, zinc, calcium, sodium, aluminum, arsenic, boron, cadmium, copper, iron, manganese, selenium, strontium and vanadium. The surface water samples will be taken before the co-located sediment sample.

Sediment samples will be collected and analyzed for pH, total organic carbon, phenols, mercury (total and TCLP), magnesium, arsenic (total and TCLP), antimony (total and TCLP), barium (total and TCLP), beryllium(total and TCLP), chromium (total and TCLP), coblat, lead (total and TCLP), nickel (total and TCLP), silver (total and TCLP), thallium (total and TCLP), zinc, calcium, sodium, aluminum, boron, cadmium (total and TCLP), copper, iron, manganese, selenium (total and TCLP), strontium, vanadium (total and TCLP) and potassium.

Depending upon surface water depth and sediment compactness, sediment samples will be collected as follows:

1. Sediment sample locations covered by less than six inches of surface water will be sampled using pre-cleaned stainless steel trowels or spoons. The samples will be transferred directly into the sample container;

2. Sediment sample locations covered by more than six inches of surface water will be sampled using a hand auger with the sample being transferred directly into a sample container or into a stainless steel bowl prior to placement into a sample container; or

3. Sediment sample locations covered by more than six inches of surface water not amenable to hand augering will be sampled using a Ponar Dredge.

A 10 foot boat will be used to transport samplers and sampling equipment to hard to reach sampling locations or sampling location in deep water. Separate stainless steel pre-cleaned hand augers, trowels or spoons will be used to collect each sample.

The slag from the slag road will be sampled using a stainless steel scoop. The sample will consist of various sizes of slag. The slag will be composited into a 32 ounce glass jar. This sample will be analyzed for total and TCLP metals.

5.0 DECONTAMINATION

Since separate sampling equipment will be used to collect each sample, it is not anticipated that any equipment will be decontaminated in the field. The dirty equipment will be decontaminated at the Collinsville Regional Office. If the Ponar Dredge is needed more than once, it will need decontamination. Field decontamination will consist of washing with Liqui-Nox soap, a potable water wash, and a de-ionized water rinse. All decontamination solutions will be collected in a 5 - 15-gallon container.

Waste PPE will be bagged on-site and transported to the Collinsville Regional Office for disposal. Since, no hazardous waste is expected to be encountered, the waste PPE will be disposed of in the Collinsville Regional Office dumpster. Any decontamination water will also be transported back to the Collinsville office for discharge to the Collinsville sanitary sewer.

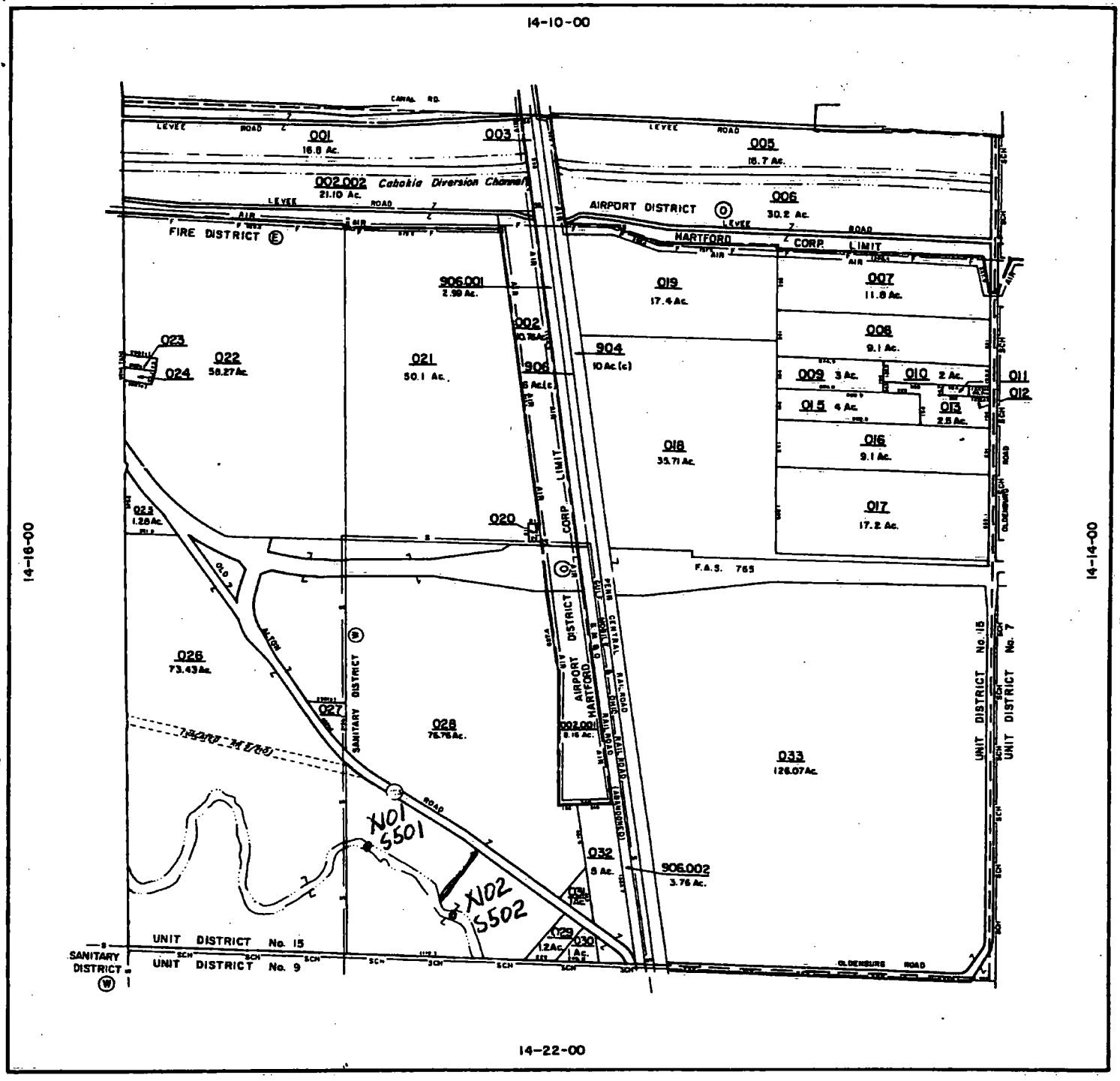
6.0 SAMPLE COLLECTION, PREPARATION, CUSTODY AND SHIPMENT

The samples collected by the IEPA sampling team will remain in the custody of the IEPA sampling team leader until shipment to the laboratory. The sample containers will be labeled with the following information:

1. Field sample number
2. Date
3. Time
4. Sampler initials
5. Sample location.


Chevron CO FACILITY
X10B
S30BH O U T E A U
AMERICAN
Brooks
St Thomas
Granite City
Pontoon Beach
GRANITE CITY
Stallings
Four Corners
INTERCHANGE 8A-B
PONTOON BEACH CORPO

Figure 4-1



CHOUTEAU TOWNSHIP
MADISON COUNTY, ILLINOIS

LEGEND

STATE OR COUNTY LINE	EASEMENT LINE	ORIGINAL SUBDIVISION BLOCK NO. (23)	DIMENSION IN FEET (Measured) 66.0 (M)	INTERSTATE HIGHWAY	
TOWNSHIP, CITY, TOWN LINE	PROPERTY LINE	ORIGINAL SUBDIVISION LOT & NO. -4- (7)		U S HIGHWAY	
SECTION LINE	LAND HOOK	AREA IN ACRES (From Deed) 10.0 Ac.		ILLINOIS STATE HIGHWAY	
HIGHWAY & STREET R/W	WATER	AREA IN ACRES (Calculated) 10 Ac.(c)		COUNTY HIGHWAY	
BLOCK LIMIT LINE	BLOCK NO. 100	DIMENSION IN FEET (From Deed) 16.5		STREET OR TOWN ROAD BY NAME	
RAILROAD R/W	PARCEL NO. 023	DIMENSION IN FEET (Scaled) 66 (c)			

SPECIAL DISTRICTS

TYPE	SYMBOL	SIZE	NAME
FIRE	—F—	(E)	MITCHEL
LIGHT	—L—		
SCHOOL	—SCH—	15 (2)	UNIT DISTRICT JUNIOR COLLEGE DISTRICT No.536
SEWER	—S—	(W)	SPECIAL SERVICE AREA NO. 1
WATER	—W—		
PARK	—P—		
VOTING	—V—	—AIR— (B)	ST LOUIS REGIONAL AIRPORT

CLT BALANCED GOVERNMENTAL SERVICES
Tax Mapping Division
COLE-LAYER-TRUMBLE COMPANY

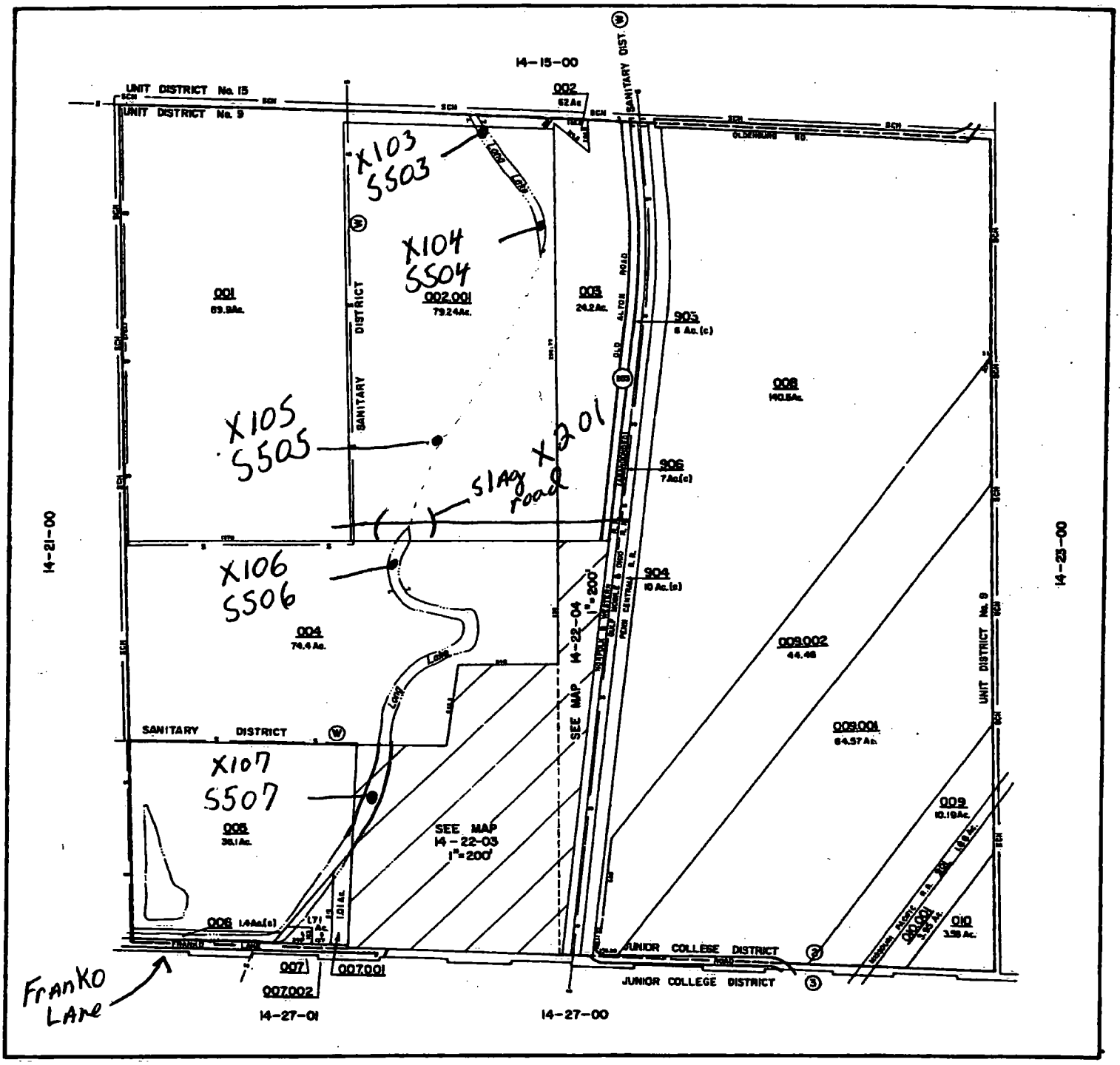
REAL PROPERTY MAP
PREPARED FOR
MADISON COUNTY BOARD MEMBERS
Maps & Plats Department
COUNTY OF MADISON

DATE OF MAP: APRIL 27, 1973
DATE OF REVISION:
SCALE: 1" = 400'

CONGRESSIONAL TOWNSHIP NO.

SECTION 15
TOWN 04 NORTH, RANGE 09 WEST
14-15-00
MAP NUMBER

Figure 4-2



CHOUTEAU TOWNSHIP

MADISON COUNTY, ILLINOIS

LEGEND				SPECIAL DISTRICTS			
STATE OR COUNTY LINE	EASEMENT LINE	ORIGINAL SUBDIVISION BLOCK NO. (22)	RESERVOIR OR PEST (Measured) 66.0 (e)	TYPE	SYMBOL	CODE	NAME
TOWNSHIP, CITY, TOWN LINE	PROPERTY LINE	ORIGINAL SUBDIVISION LOT & NO. -+- -17-	INTERSTATE HIGHWAY (70)	FIRE	—F—	(E)	MITCHEL
SECTION LINE	LAKE HOOK	AREA IN ACRES (From Deed) 10.3 Ac.	U S HIGHWAY (66)	LIGHT	—L—		
HIGHWAY & STREET R/W	WATER	AREA IN ACRES (Calculated) 10 Ac.(e)	ILLINOIS STATE HIGHWAY (3)	SCHOOL	—SCH—	9 (J)	UNIT DISTRICT JUNIOR COLLEGE DISTRICT No. 536
BLOCK LINE LINE	BLOCK NO. 100	DIMENSION IN FEET (From Deed) 10.5	COUNTY HIGHWAY (111)	SEWER	—S—	(W)	SPECIAL SERVICE AREA NO. 1
RAILROAD R/W	PARCEL NO. 123	DIMENSION IN FEET (Scaled) 66 (e)	STREET OR TOWN ROAD BY NAME	WATER	—W—		
				PARK	—P—		
				VOTING	—V—		

CLT BALANCED GOVERNMENTAL SERVICES

Tax Mapping Division

COLE-LAYER-TRUMBLE COMPANY

REAL PROPERTY MAP
PREPARED FOR
MADISON COUNTY BOARD MEMBERS
Maps & Plats Department
COUNTY OF MADISON

DATE OF MAP: APRIL 25, 1973
DATE OF REVISION: _____
SCALE: 1" = 400'

15	16	14
21	22	23
28	27	26

CONGRESSIONAL TOWNSHIP NO.

SECTION 22

TOWN 04 NORTH, RANGE 09 WEST

14-22-00
MAP NUMBER

Figure 4-3

Each sample container will be sealed on-site with evidence tape. The sealers initials, date and time of sealing will be marked on the evidence tape. A Unified Sampling Form (USF) will accompany the samples from the point of origin to the laboratory. When a copy of the USF is signed by the laboratory, a copy will be returned to the Collinsville Regional Office. The samples will be collected in containers supplied by the Agency's Bureau of Laboratories. All samples collected of Long Lake will be packaged at the Collinsville Regional Office and sent via United Parcel Service to the Agency's Champaign Laboratory.

7.0 ANALYTICAL REQUIREMENTS

The analytical methods, preservatives and holding time requirements are presented in TABLE 7-1.

TABLE 7-1
ANALYTICAL METHODS, SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Parameters	Analytical Methods	Matrix	Preservative	Holding Time	Container
Metals	Sample Preparation: SW-846 Method 3010/3005 (water) and 3050 (Soil/Sediment) Sample Analysis: SW-846 Method 6010B and 7000 series	Water and Sediment	Water: 20 ml 50% HNO_3/L Sediment: None	6 months (28 days for mercury)	water: (2) 8 oz PE bottles Sediment: 16 ounce glass jar
pH		Sediment	none	24 hours	16 oz. glass
Turbidity		Water	Refig @ 4°C	48 hours	32 oz. Plastic
TCLP Metals	SW-846 Method 1311	slag/waste	Refig @ 4°C	360 days	32 oz. glass

8.0 PROJECT SCHEDULE AND PROJECT ORGANIZATION

The IEPA sampling team will be made up of the following personnel:

1. Chris Cahnovsky - Team Leader
2. Mike Grant
3. Tom Miller

The sampling team's Site Safety Plan is included in Appendix 2.

9.0 REFERENCES

1. United State Department of Interior Fish and Wildlife Service, Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31, December 1979.

2. United State Department of Interior Fish and Wildlife Service, Wetlands Inventory for aerial photograph of Wood River, ILL.-Mo. March 1985.

APPENDIX A

SECTION X: SEDIMENT SAMPLING

A. REMINDER CHECKLISTS

1. Pre-Sampling Activities

___ Establish purpose(s) of sampling.

___ Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.

___ Assess site hazards and develop and/or review a safety plan.

___ Obtain necessary sampling and monitoring equipment; decontaminate or pre-clean the equipment, and ensure that it is in working order.

___ Bring enough clean water for rinsing, cleaning, and cooling off.

___ Schedule lab time and order bottles two weeks in advance.

___ If necessary, contact owner/operator prior to the trip to schedule the sampling event, to gain access to the site, to discuss the purpose of the sampling event, and to address any safety and security concerns at the site.

___ Be prepared to sample in extreme weather conditions, if applicable.

___ Schedule a meeting prior to the trip to ensure all sampling team members understand their roles and responsibilities.

___ Identify local suppliers of sampling expendables (e.g. ice, plastic bags), and overnight delivery services (e.g. Federal Express), and recharge of SCBA air tanks (local Fire Dept.).

___ Prepare your sample containers prior to sampling (label and organize).

2. During Sampling Activities

___ Document the sampling event. At a minimum, include weather conditions, date, time, sampler's name, photographs, any deviations from the original sampling plan, and any problems encountered.

___ Collect samples in order of volatilization. Special care is taken when collecting VOC samples.

___ If necessary, monitor the air in the area where the sampling is taking place so that you can adjust your level of protection.

___ Keep sample bottles in coolers properly preserved, sealed and maintain chain of custody.

___ Never composite VOC samples.

___ Wipe off outside of sample bottles prior to placement in cooler.

3. Post-Sampling Activities

___ Decontaminate all field equipment and PPE if appropriate, in accordance with the Health and Safety Plan. Return all reusable equipment to the IEPA warehouse or its place of origin.

___ Classify all waste generated (i.e. IDW = cuttings, rinse waters, baggies, contaminated PPE) and dispose of properly.

___ Keep samples cool; ship or drop off to appropriate laboratory, in accordance with BOL SOP for Sample Packaging and Shipping.

___ Separate incompatible waste samples so that they are not transported in the same cooler.

___ Seal odorous waste samples in a cooler to avoid breathing vapors or odors during transportation.

___ Transcribe field notes to memorandum form and submit to the Bureau File. Include photographs and a sketch of site with sampling locations clearly identified.

B. EQUIPMENT CHECKLIST

The selection of the sampling devices should be based upon waste properties (e.g. liquid or solid), site factors (e.g. waste accessibility, waste generation practices, and degree of hazard), and the analytes to be quantitated (e.g. VOCs or heavy metals). Ease of use under the site conditions and the degree of hazard associated with using a given device should also be considered. See attached sampling equipment checklist for a list of the equipment used for sampling sediment.

SAMPLING EQUIPMENT CHECKLIST

PAPERWORK:

_____IEPA Identification
_____Safety Training Certification
_____Lab Phone Numbers
_____Site Map & Directions
_____Chemical Analysis Forms
_____Chain of Custody Forms
_____Receipt for Samples (RCRA sites only)
_____Field Log Forms or Field Log Book
_____Site Safety Plan

PROJECT MANAGER:

_____Field Logbook
_____Agency Phone Book
_____Aluminum Case (for paperwork)
_____Calculator
_____Camera
_____Camera Batteries
_____Extra Film
_____Pencils & Pens (Waterproof)
_____China Markers
_____Compass
_____Pocket Knife
_____Emergency Raingear
_____Paper Towels
_____PPE Gloves_____L_____XL
_____pH Paper
_____Decon Spray Bottles:
  _____Liquinox Solution
  _____Deionized/Distilled Water

GENERAL SAMPLING EQUIPMENT:

_____Sample Bottles
_____Extra Bottle Labels
_____Waterproof Clear Tape
_____Visqueen (pre-cut)
_____Utility Knife or Pocket Knife
_____Portable Table
_____Garbage Bags
_____Rain Canopy & Poles
_____Nylon Rope
_____Water Carriers
_____Paper Towels
_____Duct Tape
_____Masking Tape
_____Flashlights & Batteries
_____Binoculars
_____Aluminum Foil
_____Shovel
_____Trowel/Sampling Spoons
_____Machete

FOR DECON:

Spray Bottles:
  _____Liquinox Solution
  _____Distilled/Deionized Water
1/2-Gallon Jugs:
  _____HCL; dilute to 5 or 10%
  _____Liquinox Solution
  _____DI Water
5-Gallon Sprayers:
  _____Liquinox Solution
  _____Tap Water
_____Extra Gallons of DI Water
_____Paper Towels
_____Aluminum Foil
_____Brushes
_____Plastic Tubs
_____5-Gallon Plastic Buckets
_____Garbage Bags

FOR FIELD MEASUREMENTS:

_____Passport
_____PID
_____FID
_____TVA
_____pH/Temp/Millivolt Meter
  _____Battery; 9-volt
_____pH Buffers; 4, 7, & 10
_____Radiation Detector
_____Draeger Pump, Tubes

PPE, SAFETY & SUPPORT:

_____Cleaning & Cooling Water
_____Drinking Water
_____Gatorade
_____Ice for Drinking Water
_____Hand Soap/Goop
_____First Aid Kit
_____Insect/Tick Repellant
_____Sunscreen
_____Fire Extinguishers
_____Walkie Talkies
_____Full-Face Respirators
_____Cartridges
_____SCBAs
_____Cylinders
_____Safety Glasses
_____Disposable Booties
_____Tyvek
_____Saranex
_____Raingear
_____Cotton Coveralls
_____Insulated Coveralls
_____Steel-Toed/Shanked Boots
_____Insulated Pack-Boots

SEALING & TRANSPORTATION

_____Coolers
_____Blue Ice
_____Dry Ice
_____Regular Ice
_____Large Liners for Coolers
_____1-Gallon Ziplock Bags
_____Quart Ziplock Bags
_____Tie Wraps
_____Large FDA Cooler Bags
_____Evidence Tape
_____Strapping Tape
_____Vermiculite

SEDIMENT SAMPLING EQUIPMENT

_____Trowel or Scoop
_____Thin-Wall Tube Auger(s)*
_____Ekman Dredge
_____Ponar Dredge
_____Coring Device
_____Bailer Cord
_____Chem Wipes

* Including handles

C. PROCEDURES

1. **Trowel or Scoop - Surface Sediment Sampling Beneath a Shallow Aqueous Layer (Figure 10a).**

   a. Be certain the trowel or scoop has been decontaminated prior to use.

   b. Remove any debris on the bed of the stream or other water body with such tools as a spade, shovel to prepare the surface sediment for sampling, being careful to minimize disturbance or the water and sediment.

   c. Using a stainless steel or plastic trowel or scoop, collect a sufficient quantity of surface sediment to provide a representative sample.

   d. Collect the first sample for VOC analysis directly from the sampler and transfer to the appropriate sample container(s).

   e. When analyses are required for parameters other than VOCs, mix the remainder of the collected sediment to obtain a homogeneous sample, then transfer to the appropriate sample container(s).

   f. Return the unused portion of the sample to the sampling point.

   g. Transfer the sample container(s) to a chilled cooler and prepare for shipping.

2. **Thin-Wall Tube Augers - Surface Sediment Sampling Beneath a Shallow Aqueous Layer (Figure 10b).**

   a. An acetate core may be inserted into the auger prior to sampling, if characteristics of the sediments or body water warrant. By using this technique, an intact core can be extracted.

   b. Insert the auger into the material at a 0° to 45° angle to minimize spillage of the sample. Extraction of samples may require tilting the sampler.

   c. Rotate the auger once or twice to cut a core of material.

   d. Slowly withdraw the auger, making sure that the slot is facing upward.

   e. Collect the first sample for VOC analysis directly from the auger and transfer to the appropriate sample container(s).

f. When analyses are required for parameters other than VOCs, mix the remainder of the collected sediment to a obtain a homogeneous sample, then transfer to the appropriate sample container(s).

g. Return the unused portion of the sample to the sampling point.

h. Transfer the sample container(s) to a chilled cooler and prepare for shipping.

3. **Augers and Thin-Wall Tube Samplers - Deep Sediment Sampling Beneath a Shallow Aqueous Layer (Figure 10b).**

a. Attach the auger bit to an extension rod, then attach the "T" handle to the extension rod.

b. Clear the area to be sampled of any surface debris using a spade or shovel being careful to minimize the disturbance of the water and bed of the water body.

c. Begin auguring, periodically removing any accumulated sediment from the auger.

d. After reaching the desired depth, slowly and carefully remove the auger from the boring. When sampling directly from the auger, collect the sample after the auger is removed from the boring and proceed to step (l).

e. Remove the auger tip from extension rods and replace with a pre-cleaned thin-wall tube sampler with the proper cutting tip.

f. Carefully lower the tube sampler down the borehole, being careful to not scrap the borehole sides, and gradually force the tube sampler into the sediment. **DO NOT HAMMER THE EXTENSION RODS TO FACILITATE CORING SINCE THE VIBRATIONS MAY CAUSE THE BORING WALLS TO COLLAPSE.**

g. Remove the tube sampler and unscrew the extension rods.

h. Remove the cutting tip and core from the device.

i. Discard the top of the core (approximately one (1) inch), up-hole material collected by the tube sampler prior to reaching the collection point.

j. Collect the first sample for VOC analysis directly from the sampler and transfer to the appropriate sample container(s).

k. When analyses are required for parameters other than VOCs, mix the remainder of the collected sediment to a obtain a homogeneous sample, then transfer to the appropriate sample container(s).

l. Return the unused portion of the sample to the sampling point.

m. Transfer the sample container(s) to a chilled cooler and prepare for shipping.

4. **Ekman Dredge - Sediment Sampling from Beneath a Deep Aqueous Layer (Figure 10c).**

a. Thread a sturdy nylon rope or stainless steel cable through the bracket of an Ekman dredge, or secure the extended handle to the bracket with machine bolts.

b. Attach springs to both sides. Arrange the Ekman dredge sampler so that the jaws are in the open position and trip cables are positioned over the release studs.

c. Lower the sampler to just above the sediment surface.

d. Drop the sampler sharply onto the sediment.

e. Trigger the jaw release mechanism by lowering a messenger down the line, or by depressing the button on the upper end of the extended handle.

f. Raise the sampler and slowly decant any free liquid through the top of the sampler over the sampling point, being careful to retain the sediments.

g. Open the dredge and transfer sediments to a stainless steel or plastic bucket. Continue to collect additional sediment until sufficient material has been accumulated.

h. Collect the first sample for VOC analysis directly from the sampler and transfer to the appropriate sample container(s).

i. When analyses are required for parameters other than VOCs, mix the remainder of the collected sediment to obtain a homogeneous sample, and then transfer to the appropriate sample container(s).

j. Return the unused portion of the sample to the sampling point.

k. Transfer the sample container(s) to a chilled cooler and prepare for shipping.

5. Ponar Dredge - Sediment Sampling from Beneath a Deep Aqueous Layer (Figure 10d).

a. Attach a sturdy nylon rope or stainless steel cable to the hook provided on the top of the dredge.

b. Arrange the Ponar dredge sampler in the open position, setting the trip bar so the sampler remains open when lifted from the top.

c. Slowly lower the sampler to just above the sediment.

d. Drop the sampler sharply into the sediment, then pull sharply up on the line, thus releasing the trip bar and closing the dredge.

e. Raise the sampler to the surface and slowly decant any free liquid through the screens on top of the dredge being careful to retain sediments.

f. Open the dredge and transfer the sediment to a stainless steel or plastic bucket. Continue to collect additional sediment until sufficient material has been accumulated.

g. Collect the first sample for VOC analysis directly from the sampler and transfer to an appropriate sample container(s).

h. When analyses are required for parameters other than VOCs, mix the remainder of the collected sediment to obtain a homogeneous sample, then transfer to an appropriate sample container(s).

i. Return the unused portion of the sample to the sampling point.

j. Transfer the sample container(s) to a chilled cooler and prepare for shipping.

6. Coring Device - Sediment Sampling from Beneath a Deep Aqueous Layer (Figure 10e).

a. Assemble the coring device by inserting the acetate core into the sampling tube.

b. Insert the "eggshell" check valve mechanisms into the tip of the sampling tube with the convex surface positioned inside the acetate core.

c. Screw the coring point onto the tip of the sampling tube.

d. Screw the handle onto the upper end of the sampling tube and add extension rods as needed.

e. Place the sampler in a perpendicular position to the material to be sampled.

f. If using the "T" handle, place downward pressure on the device until the desired depth is reached. Then rotate the sampler to shear off the core of the bottom, retrieve the device and proceed to Step (o) below.

g. If the drive hammer is selected for consolidated sediments, insert the tapered handle of the drive hammer through the drive head.

h. With the left hand holding the tube, drive the sampler into the material to the desired depth being careful to not drive the tube further than the tip of the hammer's guide.

i. Record the length of the tube that penetrated the sample material, and the number of blows required to obtain the depth.

j. Remove the drive hammer and fit the keyhole-like opening on the flat side of the hammer onto the drive head. In this position, the hammer serves as a handle for the sampler.

k. Rotate the sampler at least two (2) revolutions to shear off the sample at the bottom.

l. Lower the sampler handle (hammer) until it just clears the two (2) ear-like protrusions on the drive head, and rotate about 90°.

m. Withdraw the sampler by pulling the handle (hammer) upwards and dislodging the hammer from the sampler.

n. Unscrew the coring point and remove the "eggshell" check valve.

o. Slide the acetate core out of the sampler tube. The acetate core may be capped at both ends. Collect the first sample for VOC analysis directly from the sampler and transfer to the appropriate sample container(s).

p. When analyses are required for parameters other than VOC's, transfer the

remainder of the sample to a stainless steel or plastic bucket and mix to obtain a homogeneous sample, then transfer to the appropriate sample container(s).

q. Return the unused portion of the sample to the sampling point.

r. Transfer the sample container(s) to a chilled cooler and prepare for shipping.

D. REFERENCES

Reproduced in part from OSWER Directive 9360.4-03, January 1991.

E. FIGURES

10a -- Trowel (Scoop)

10b -- Thin-Wall Tube and Bucket Augers

10c -- Ekman Dredge

10d -- Ponar Dredge

10e -- Coring Device Sampler

FIGURE 10a – TROWEL (SCOOP)

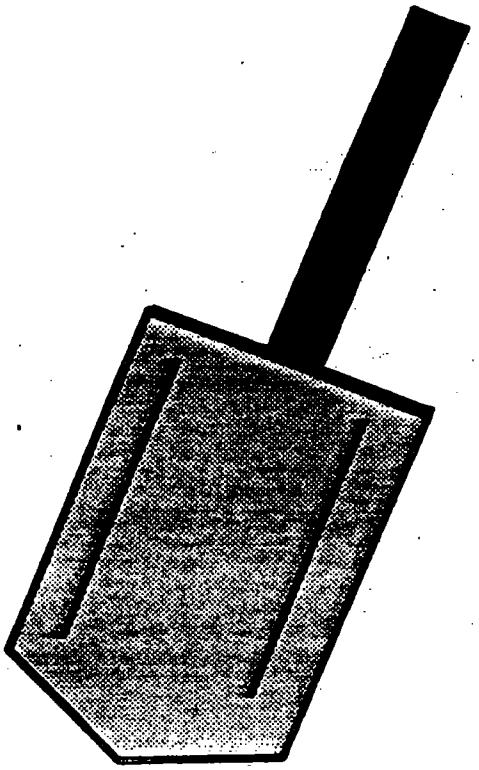


FIGURE 10b – AUGER SAMPLERS

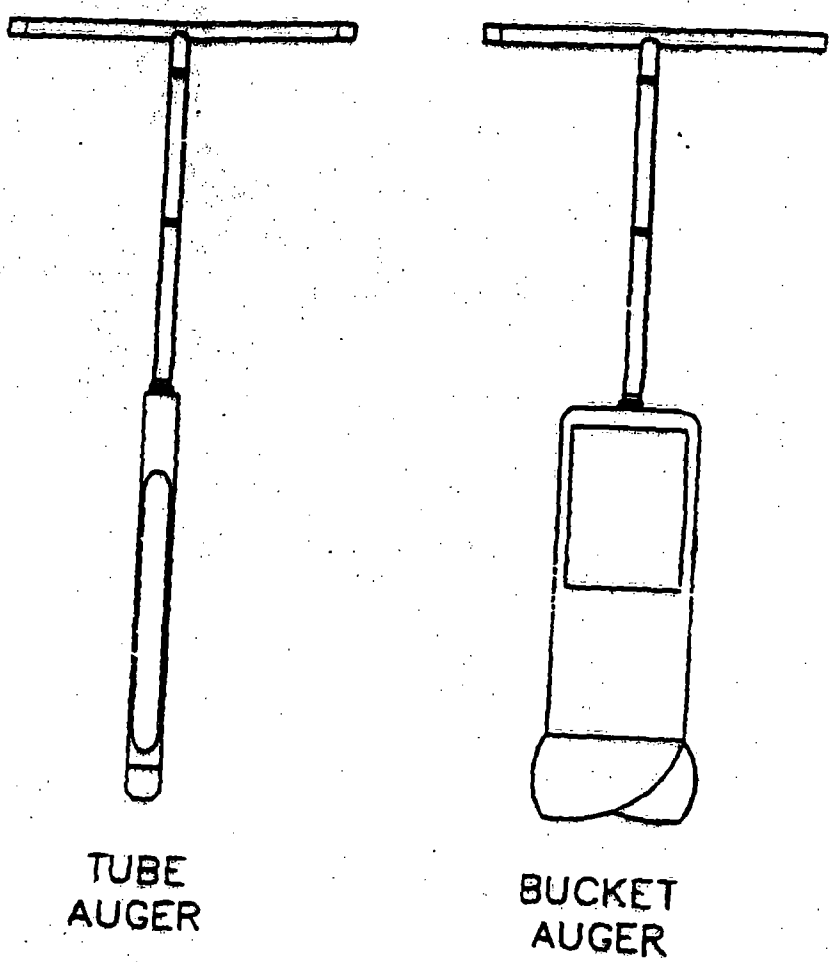


FIGURE 10c – EKMAN DREDGE

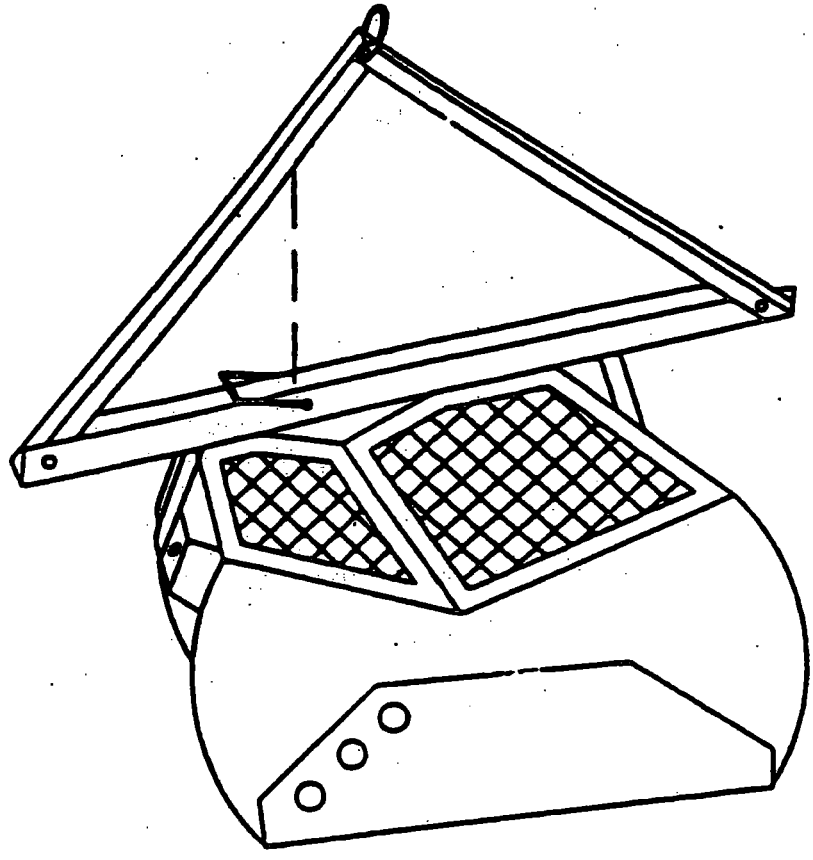
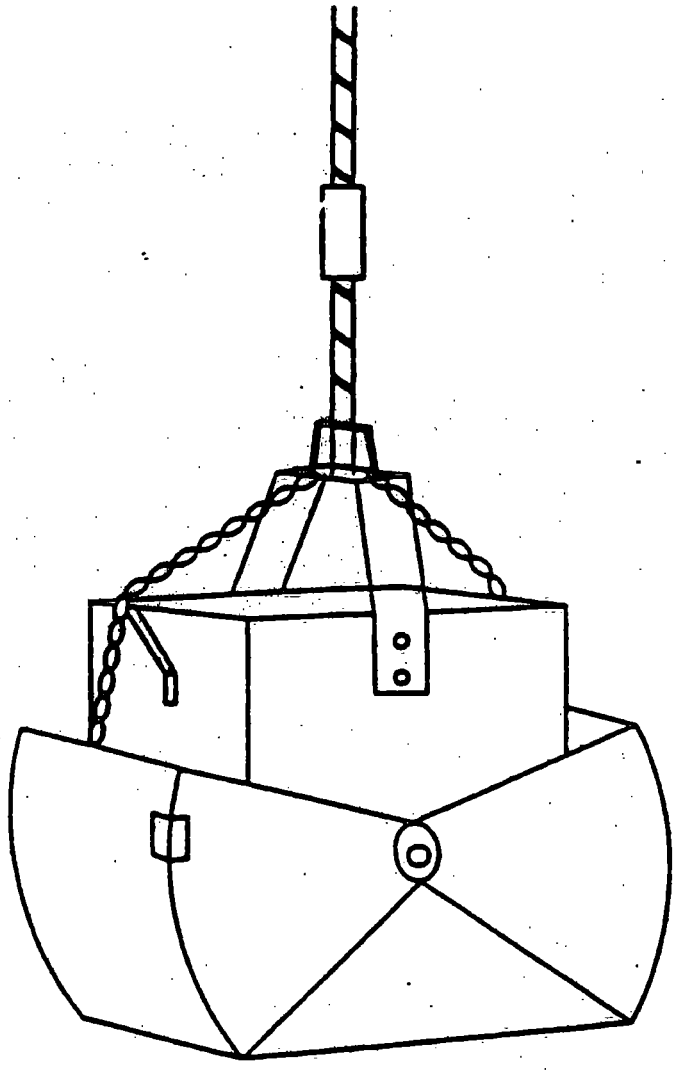


FIGURE 10d – PONAR DREDGE



APPENDIX B

SITE SAFETY PLAN
for
SMALL-SCALE, SHORT-DURATION HAZARDOUS WASTE OPERATIONS

I. SITE OVERVIEW

Site Name
Long Lake

Location
Chouteau Township - Mitchell, Madison County, Illinois

Tasks to be accomplished:

Task A
Obtain surface water samples

Task B
Obtain sediment samples

Task C

Task D

Start Date/Time:		Complete Date/Time:	

Site Description/History
Long Lake

Topography
Wooded, intermittently flooded, water depth less than 7 ft.

Surrounding Population
Residential and Agricultural

Additional Information

II. PERSONNEL

	Duty/Name
1	Chris Cahnovsky - Team Leader
2	Gina Search - Safety Officer
3	Mike Grant - Sampler
4	John Senjan - Sampler
5	
6	

III. HAZARD EVALUATION

Chemical hazards anticipated:

Chemical Name	PEL	IDLH	IP	Relative Response	LEL	Route of Entry
Lead	.100 mg/m^3	100 mg/m^3	N/A	N/A	N/A	Ingestion

Chemical Name	PEL	IDLH	IP	Relative Response	LEL	Route of Entry
Cadmium	.005 mg/m^3	9 mg/m^3	N/A	N/A	N/A	Ingestion

Chemical Name	PEL	IDLH	IP	Relative Response	LEL	Route of Entry

Chemical Name	PEL	IDLH	IP	Relative Response	LEL	Route of Entry

Chemical Name	PEL	IDLH	IP	Relative Response	LEL	Route of Entry

Physical hazards anticipated:

Hazard:	Water Hazard (Drowning)
Hazard control:	Life preservers and life vests worn in boat

Hazard:	Water Hazard (Drowning)
Hazard control:	Life lines to sampler in water

Hazard:	Lack of communication
Hazard control:	Two-way radios and cell phone

Hazard:	Boating Safety
Hazard control:	Review IL Boat Registration, Titling and Safety Act Digest. IDNR, 1996 (attached)

IV. SITE CONTROL

Description of Exclusion Zone and Boundaries (Site Map Attached)
N/A

Description of Contamination Reduction Zone and Boundaries
N/A

Description of Support Zone and Boundaries
N/A

Hand signals

1. Hands gripping throat ——— Out of air, can't breathe
2. Grip partner's wrist or both hands around waist ——— Leave area immediately
3. Hands on top of head ——— Need assistance
4. Thumbs up ——— OK, I am all right, I understand
5. Thumbs down ——— No, negative

Standard Operating Procedures:

A. Sampling procedures: Conduct sampling in accordance with the IEPA BOL Sampling Procedures Guidance Manual.

B. Excavations: if excavations will be made, comply with the Underground Utility Facilities Damage Prevention Act by contacting JULIE at least two working days in advance at 800-892-0123. The Act defines "excavation" as "...any operation in which earth, rock, or other material in or on the ground is moved, removed, or otherwise displaced by means of any tools...."

C. Permit-required Confined Spaces: A permit-required confined space is an area that has limited means for entry and exit, was not designed for continuous employee occupancy, and has the potential to contain a serious health or safety hazard (usually a hazardous atmosphere). Examples include manholes, tanks, vaults, excavations. IEPA personnel are not authorized to enter permit-required confined spaces.

D. Heat Stress: At temperatures above 70 degrees F., especially when PPE is used, heat stress is often the greatest site hazard. Provide appropriate cooling equipment, cooled drinking fluids, and frequent breaks. Prevent and treat heat stress in accordance with your first aid training.

E. Material Safety Data Sheets: Obtain MSDS for known chemical hazards and attach for review by all site personnel.

F. All personnel arriving or departing the site should log in and out with the Record-keeper. All activities on site must be cleared through the Project Team Leader. There will be a minimum of two people assigned to each task (buddy system).

G. Normal and Emergency Communications: A cell phone is mandatory.

H. If adverse weather is possible, monitor a local radio broadcast station or other service to stay abreast of the weather.

I. All operations and equipment will comply with OSHA Regulations 29 CFR 1910.120 and other applicable elements of OSHA 29 CFR 1910 and 1926. Before site operations begin all employees involved in these operations will have read and understood this site safety plan.

J. Training and medical monitoring: All routine site personnel are required 40-hour HAZWOPER training and medical monitoring. Employees with 24-hour training may perform specific tasks, provided that it is ensured that they will not be exposed to health hazards above permissible exposure limits. Visitors or support personnel who remain in the support zone are not required health and safety training.

K. Other:

V. PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protective equipment have been designated for the applicable work areas or tasks. No changes to the specified levels of protection shall be made without the approval of the site safety officer and the project team leader.

Work Area/Zone	Job Function/Task	Level of Protection: B C D Other
Boat	Sampling & Labeling	C w/gloves & life vest

Work Area/Zone	Job Function/Task	Level of Protection: B C D Other
Lake	Sampling	C - waders & life vest

Work Area/Zone	Job Function/Task	Level of Protection: B C D Other
Shore	Record Keeping/Sample Handling	C

Work Area/Zone	Job Function/Task	Level of Protection: B C D Other

The following specific PPE items have been selected:

X	Latex gloves		Nitrile gloves		Neoprene gloves
	Butyl gloves		Silver Shield gloves		Hazmax Chemical boots
	Latex outer boots		Tyvek coveralls		Saranex coveralls
	APR Respirator		SCBA		Hardhat
	APR Cartridge:		Safety Glasses		Safety Goggles
	Ear Protection		Cotton Coveralls	X	Other: Radios
X	Other: Life Vest	X	Other: Hip Waders		Other:

VI. AIR MONITORING

The following air monitoring instruments shall be used on-site at the specified intervals:

	Instrument type	Frequency
	PID	N/A
	TVA	N/A
	Oxygen indicator/Combustible	N/A
	Detector tubes:	N/A
	Personal air pump	N/A
	Other:	N/A

Action level responses
Unknown gas/vapor PID/FID reading above background to 5 ppm: use level C protection
Unknown gas/vapor PID/FID reading 5 to 500 ppm: use level B protection
Unknown gas/vapor PID/FID reading above 500 ppm: evacuate/control the hazard
Known gas/vapor PID/FID reading greater than half the PEL: use level C protection
Known gas/vapor PID/FID reading IDLH: use SCBA/control the hazard
Oxygen below 19.5%: use SCBA/control the hazard
Combustible gas indicator: at or above 10% LEL: evacuate.
Other:

VII. DECONTAMINATION PROCEDURES

Wear disposable coveralls, disposable outer boots, and disposable outer gloves. Avoid walking on, kneeling on, or sitting on contaminated surfaces. Avoid contaminating any non-disposable clothing or equipment. Use private contractor's decontamination facilities if established. Decontamination stations shall be set up before personnel enter the exclusion zone. Personnel and equipment leaving the exclusion zone shall be thoroughly decontaminated. Any PPE utilized will be removed, bagged, and if possible left on site. If this is not possible, the bagged PPE will be brought back to the

Agency. Decon equipment includes garbage bags, "Wet Ones," paper towels, Visqueen, Alconox, wash tubs, water, pressure water sprayer.

The following example of personal decontamination is based on the exclusive use of disposable boot covers, gloves, and coveralls.
Steps:

1. Segregated equipment drop
2. Remove outer booties and outer gloves; remove the most contaminated first
3. Remove coveralls
4. Remove first pair of inner gloves
5. Remove hard hat
6. Remove respirator
7. Remove second pair of inner gloves
8. Replace hard hat and put on eye protection until leaving the site
9. Wash hands

When possible use disposable sampling equipment and leave at the site, if possible. Otherwise, equipment should be bagged, and brought back to the agency for disposal. Reusable, non-disposable equipment (stainless steel spoons, split spoons, measuring tape, etc) will be decontaminated before removal from the site. The minimum decontamination procedure for all equipment is as follows:

1. Water rinse
2. Soap wash (Alconox)
3. Water rinse
4. Air dry
5. Seal with aluminum foil

VIII. EMERGENCY PROCEDURES

The Site Safety Officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedures are followed.

Written Directions to the Selected Hospital (Map Attached)

Personnel Injury in the Exclusion Zone: Upon notification of an injury in the Exclusion Zone, all site personnel shall assemble at the decontamination line. The rescue team will enter the Exclusion Zone (if required) to remove the injured person to the hotline. The Site Safety Officer and Project Team Leader should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the Support Zone. Appropriate first aid shall be initiated, and contact should be made for an ambulance and with the designated medical facility (if required). No persons

shall reenter the Exclusion Zone until the cause of the injury or symptoms is determined.

Personnel Injury in the Support Zone: Upon notification of an injury in the Support Zone, the Project Team Leader and Site Safety Officer will assess the nature of the injury. If the cause of the injury does not affect the performance of site personnel, operations may continue, with the on-site first aid initiated and necessary follow-up as stated above. If the injury increases the risk to others, all site personnel shall move to the decontamination line for further instructions. Activities on site will stop until the added risk is removed or minimized.

Fire/Explosion: Upon notification of a fire or explosion on site, all site personnel shall be assembled at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

Personal Protective Equipment Failure: If any site worker experiences a failure or malfunction of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment on site fails to operate properly, the Project Team Leader and Site Safety Officer shall be notified and then determine the effect of this failure on continuing operations on site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the Exclusion Zone until the situation is evaluated and appropriate actions taken.

In all situations, when an on-site emergency results in evacuation of the Exclusion Zone, personnel shall not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed
4. Site personnel have been briefed on any changes in the Site Safety Plan.

First-aid equipment available on-site: First-aid kit, emergency eye wash.

List of emergency phone numbers Take Cell Phone	
Police:	911
Fire:	911
Ambulance:	911
Hospital:	

IX. CERTIFICATION

Personnel signing below certify that they understand the site work plan, understand this site safety plan, and have completed the required training and medical monitoring.

Required: 40-HourTraining:	X	24-Hour:		None:		Medical monitoring required (yes/no):	X
Completed: 40-Hour:	X	24-Hour:		None:		Medical monitoring completed (yes/no):	X
Duty/Name/Signature:							

Required: 40-HourTraining:	X	24-Hour:		None:		Medical monitoring required (yes/no):	X
Completed: 40-Hour:	X	24-Hour:		None:		Medical monitoring completed (yes/no):	X
Duty/Name/Signature:							

Required: 40-HourTraining:	X	24-Hour:		None:		Medical monitoring required (yes/no):	X
Completed: 40-Hour:	X	24-Hour:		None:		Medical monitoring completed (yes/no):	X
Duty/Name/Signature:							

Required: 40-HourTraining:	X	24-Hour:		None:		Medical monitoring required (yes/no):	X
Completed: 40-Hour:	X	24-Hour:		None:		Medical monitoring completed (yes/no):	X
Duty/Name/Signature:							

Required: 40-HourTraining:		24-Hour:		None:		Medical monitoring required (yes/no):	
Completed: 40-Hour:		24-Hour:		None:		Medical monitoring completed (yes/no):	
Duty/Name/Signature:							

Required: 40-HourTraining:		24-Hour:		None:		Medical monitoring required (yes/no):	
Completed: 40-Hour:		24-Hour:		None:		Medical monitoring completed (yes/no):	
Duty/Name/Signature:							

X. APPENDICES

Appendix A: Site Map

Appendix B: Route to Hospital

ARTICLE 1. DEFINITIONS

Vessel or Watercraft means every description of watercraft, used or capable of being used as a means of transportation on water, except a seaplane on the water, innertube, air mattress or similar device, and boats used for concession rides in artificial bodies of water designed and used exclusively for such concessions.

Motorboat means any vessel propelled by machinery, whether or not such machinery is the principal source of propulsion.

Personal Watercraft means a vessel that uses an inboard motor powering a water jet pump as its primary source of motor power and that is designed to be operated by a person sitting, standing, or kneeling on the vessel, rather than the conventional manner of sitting or standing inside the vessel, and includes vessels that are similar in appearance and operation but are powered by an outboard or propeller driven motor.

Specialty Prop-craft means a vessel that is similar in appearance and operation to a personal watercraft but that is powered by an outboard or propeller driven motor.

Sailboat means any watercraft propelled by sail or canvas, including sailboards.

Waters of this State means any water within the jurisdiction of this State.

Application and Jurisdiction: The Department shall, for the purposes of this Act, have full and complete jurisdiction of all waters within the boundaries of the State of Illinois.

ARTICLE 2. INSPECTION – ENFORCEMENT – PROSECUTIONS

Inspection: Agents of the Department of Natural Resources or other duly authorized police officers may board and inspect any watercraft at any time for the purpose of determining compliance with this act.

Resistance to Officers:

a. It is unlawful for any person to resist or obstruct any officer or employee of the Department in the discharge of his duties under the provisions hereof.

b. It is unlawful for the operator of a watercraft, having been given a signal by a conservation police officer, sheriff, deputy sheriff, or other police officer directing the operator of the watercraft to a stop, to willfully fail or refuse to obey the direction, to increase speed,

to extinguish lights, or otherwise flee or attempt to elude the officer. The signal given by the officer may be by hand, voice, sign, siren, or blue or red light.

ARTICLE 3 & 3A. REGISTRATION AND TITLING

Boats which must be registered and titled: All watercraft operated on the waters within the jurisdiction of this state shall be registered and titled.

Boats exempted from registration and titling: Watercraft shall not be required to be registered and titled under this Act if it is:

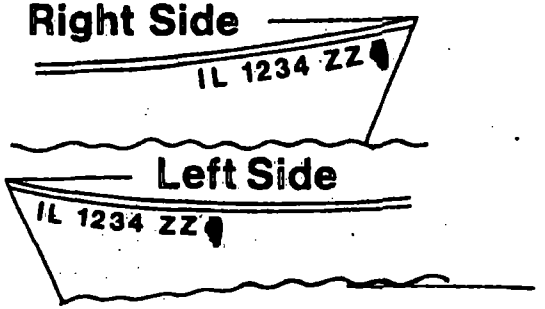
1. A watercraft which has a valid marine document issued by the United States Coast Guard, **EXCEPT THAT** any such documented vessel used upon the waters of this State for more than 60 days in any calendar year shall be registered in compliance with this act.
2. Already covered by a number in full force and effect from another state, if such boat will not be used within this State for a period in excess of 60 consecutive days.
3. A sailboard.
4. A watercraft from a country other than the United States temporarily using the waters of this State.
5. A watercraft owned by the United States, a state or subdivision thereof, used solely for official purposes, and clearly identifiable.
6. A vessel used exclusively as a ship's lifeboat.
7. Watercraft while competing in any race approved by the Department, or if the watercraft is designed and intended solely for racing while engaged in navigation that is incidental to preparation of the watercraft for the race. Preparation of the watercraft for the race may be accomplished only after obtaining the written authorization of the Department.
8. Non-powered watercraft owned and operated on water completely impounded on land belonging to the owner of the watercraft. This does not apply to waters controlled by a club or association.
9. A canoe or kayak which is owned by an organization which is organized and conducted on a not-for-profit basis with no personal profit inuring to anyone as a result of the operation.

Registration-Title Application: The owner of each watercraft requiring registration and titling by this State shall file a watercraft application with the Department. The application shall be signed by the owner of the boat, and shall be accompanied by the required documents (New boats: you must surrender the original properly endorsed Manufacturer's Certificate of Origin; Boats previously registered or titled in another state: you must surrender the owner's registration certificate and/or title; Illinois titled boats: you must surrender the owner's Illinois title) and appropriate fee.

Warning: Boats purchased new or used from out of state dealers, manufacturers or lending institutions are subject to tax. You must contact the Illinois Department of Revenue at 1-800-732-8866 for instructions **before** submitting an application.

Registration Number Display: The owner shall paint on or attach to both sides of the bow (front) of the boat the registration number, which shall be of block characters at least 3 inches in height. The figures shall read from left to right, be of contrasting color to their background and be maintained in a legible condition. No other numbers shall be displayed on the bow. A space shall be provided between the IL and the number and another space between the number and the letters which follow. A vessel that is covered by a valid marine document must display current expiration decals, but is exempt from the requirement to display an Illinois registration number. Non-powered canoes and kayaks are not required to display registration numbers. Display decals only.

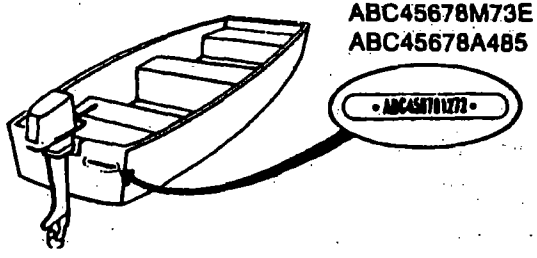
Note: For Federally documented vessels, the Illinois registration decals are to be displayed on either side of the Federally documented name of the vessel.



Hull Identification Number (HIN): Boats manufactured after 1972 will have a hull identification number consist-

ing of 12 characters in one of the following three formats:

ABC456781273
ABC45678M73E
ABC45678A485



No person may possess a watercraft that has the HIN removed, defaced or obliterated.

ARTICLE 4. BOAT EQUIPMENT

The Illinois Boat Registration and Safety Act provides that the following equipment will be provided in various classes of boats.

A. **Personal Flotation Devices (life preservers):** It is unlawful to operate any watercraft unless at least one U.S. Coast Guard approved PFD of the following types or their equivalent is on board for each person: Type I, Type II or Type III (wearable PFD s). The PFD requirement does not apply to sailboards.

Any watercraft 16 feet or more in length, except a canoe or kayak, must have at least one Type IV (throwable) U.S. Coast Guard approved PFD or its equivalent on board, in addition to the PFD s required above. When assisting a person on water skis, aquaplane, or similar device, there must be one U.S. Coast Guard approved PFD on board the watercraft for each person being assisted or towed, or worn by the person being assisted or towed. NOTE: A ski belt is not a U.S. Coast Guard approved PFD.

Type I, and II personal flotation devices are designed to turn an unconcious person in the water from a face downward position to a vertical or slightly backward position.

A Type III personal flotation device is designed to keep a conscious person in a vertical or slightly backward position. A Type III is not required to turn an unconscious person to a face up position in the water but will maintain a stable face up attitude once a person assumes that position.

A Type IV personal flotation device is designed to be thrown to a person in the water and not worn.

A Type V personal flotation device is approved for restricted use and may be used in lieu of the Type I, II or III only when used in the activity for which it is approved.

The type and USCG approval information will be found on the device label.

All such PFD's mentioned in this section must be readily accessible, in serviceable condition, of an appropriate size for whom it is intended, and legibly marked with the U.S. Coast Guard approval number.

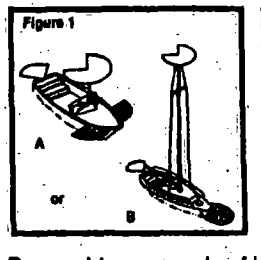
No person may operate a personal watercraft or specialty prop-craft unless each person aboard is wearing a Type I, Type II, Type III or Type V PFD approved by the United States Coast Guard.

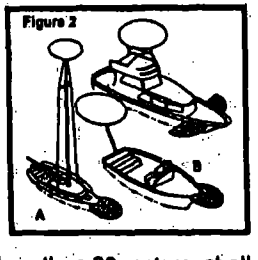
B. **Lanyards:** No person may operate any motorboat, including personal watercraft, which is equipped with a lanyard type engine cut-off switch unless such lanyard is properly attached to his or her person, clothing or worn PFD, as appropriate for the vessel.

C. **Lights:** Every vessel shall carry and display when underway between the hours of sunset and sunrise such lights as shall be required by the United States Coast Guard for watercraft of equivalent length and type.

The U.S. Coast Guard Navigation Rules, International-Inland encompasses lighting requirements for every description of watercraft. The information provided here is intended for power-driven and sailing vessels less than 20 meters.

Power-Driven Vessels



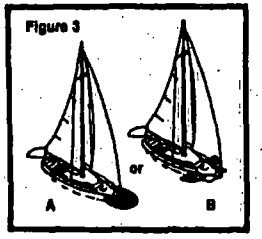


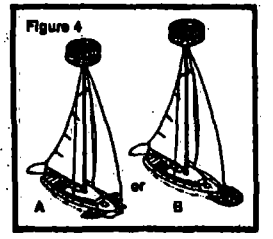
Power-driven vessels of less than 20 meters, shall exhibit navigation lights as shown in Figure 1.

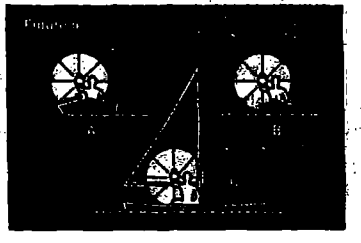
Vessels of less than 12 meters in length, may show the lights in either Figure 1 or Figure 2.

Sailing vessels operating under machinery, or under sail and machinery are considered power-driven and must display the lights prescribed for a power-driven vessel.

Sailing Vessels and Vessels Under Oars







Sailing vessels less than 20 meters exhibit navigation lights shown in Figure 3 or 4 or may be combined in a single lantern carried at the top of the mast as shown in Figure 5.

Sailing vessels less than 7 meters may carry an electric torch or lighted lantern showing a white light to be displayed in sufficient time to prevent collision (see Figure 6), if practicable, the lights prescribed for sailing vessels less than 20 meters should be displayed.

Vessels under oars may display the lights prescribed for sailing vessels, but if not, must have ready at hand an electric torch or lighted lantern showing a white light to be shown in sufficient time to prevent collision (see Figure 6).

Lights for Anchored Vessels

Power-driven vessels and sailing vessels at anchor must display anchor lights. An anchor light for a vessel less than 20 meters in length is an all-round white light visible for 2 miles exhibited where it can best be seen.

Vessels less than 7 meters are not required to display anchor lights unless anchored in or near a narrow channel, fairway or anchorage or where other vessels normally navigate.

D. **Mufflers:** All motorboats shall be equipped and maintained with an effective muffler or underwater exhaust system. An effective muffler or underwater

exhaust system which does not produce sound levels that create excessive or unusual noise, or sound levels that are in excess of 90 decibels when subjected to a stationary sound level test or 75 decibels when in operation on the waters of this State.

A motorboat being tuned up for or participating in official trials for a sanctioned race or regatta conducted under a permit, or a motorboat being operated by a boat or marine engine manufacturer for the purpose of testing or development are exempt from this requirement.

Any person who operates any motorboat upon the waters of this State shall be deemed to have given consent to the test or tests prescribed by the Department to determine if the motorboat is in compliance.

E. **Whistles:** It is unlawful to operate a motorboat without a mouth, hand, or power operated whistle, horn, or other appliance capable of producing a blast of 2 seconds or more duration and audible for at least one half mile. This regulation applies to all motorboats, regardless of size or motor.

F. **Fire Extinguisher:** It is unlawful to operate any motorboat equipped with an internal combustion engine anywhere in this State without at least one U.S. Coast Guard approved fire extinguisher so placed as to be readily accessible and in such condition as to be ready for immediate and effective use.

G. **Carburetor Arrestors:** Except for outboard motors, all motorboats shall be fitted with a Coast Guard approved device for arresting backfire.

H. **Ventilators:** Except for open boats, all motorboats using fuel having a flashpoint of 110 degrees fahrenheit or less shall have at least 2 ventilator ducts, fitted with cowls or their equivalent, for the efficient removal of explosive or flammable gases from the bilges of every engine and fuel tank compartment. There shall be at least one exhaust duct installed so as to extend from the open atmosphere to the lower portion of the bilge and at least one intake duct installed so as to extend to a point at least midway to the bilge or at least below the level of the carburetor air intake. The cowls shall be located and trimmed for maximum effectiveness and in such manner so as to prevent displaced fumes from being recirculated.

I. **Siren and Flashing Lights:** The use of sirens or flashing lights shall be unlawful except on duly designated patrol boats, and such sirens or flashing

lights used in violation of the Boating Act shall be considered a public nuisance and subject to confiscation and disposal as determined by a competent court of jurisdiction.

J. **Capacity Plates:** Boats purchased after January 1, 1968 must have affixed permanently a manufacturer's capacity plate.

K. **Battery Covers:** Storage batteries shall be provided with suitable supports and secured against shifting. Batteries shall be equipped with non-conductive shielding means to prevent accidental shorting.

L. **Sealing of Marine Heads:** No marine head (toilet) on any watercraft used upon waters of this state may be so constructed and operated as to permit the discharge of any sewage into the waters directly or indirectly.

M. **Visual Distress Signals:** It is unlawful to operate any watercraft on the waters of Lake Michigan without having onboard visual distress signals as required and approved by the U.S. Coast Guard, so placed as to be readily accessible and in such condition as to be ready for immediate and effective use.

ARTICLE 5. OPERATION OF BOATS

A. **Careless Operation:** No person shall operate any watercraft in a careless or heedless manner as to endanger any person or property, or at a rate of speed greater than will permit him in the exercise of reasonable care to bring the watercraft to a stop within the assured clear distance ahead.

B. **Reckless Operation:** No person shall operate any watercraft, specialty prop-craft, personal watercraft or manipulate any water skis, aquaplane, or similar device in such a manner as to willfully or wantonly endanger the life, limb or property of any person, to weave through congested traffic, to jump the wake of another vessel unreasonably or unnecessarily close to the other vessel or when visibility around the other vessel is obstructed, to wait until the last possible moment to swerve to avoid collision, or operate any watercraft so as to approach or pass another watercraft in such a manner or at such a rate of speed as to create a hazardous wake or wash.

C. **Passing:** When two boats are approaching each other "head on" or nearly so (so as to involve risk of collision), each boat must bear to the right and pass the other boat on its left side.

D. **Crossing:** When boats approach each other at right angles, the boat approaching on the right side has the right of way.

E. **Overtaking:** One boat may overtake another on either side but must grant right of way to the overtaken boat.

F. **Sailboats and Rowboats:** When a motorboat is approaching a boat propelled solely by sails or oars, the motorboat must yield the right of way to the sailboat or rowboat except, when a large craft is navigating in a confined channel, the large craft has the right of way over a boat propelled solely by oars or sails.

G. **Restricted Areas:** No person shall operate a motorboat in a water area which has been clearly marked by buoys or signs as a bathing, fishing or otherwise restricted area, except in the manner prescribed by the buoys or signs marking the area. In areas designated as "No Wake" areas, no motorboat underway shall exceed 5 miles per hour while in the posted "No Wake" area.

H. **Slow — No Wake Areas:** No person shall operate a watercraft within 150 feet of a public launching ramp owned, operated or maintained by the Department or a political subdivision of the State at greater than a "No Wake" speed. Posting of the areas is not required.

I. **Water Skiing:** When towing a person on water skis, aquaplane or similar device, at least two competent persons must be in the boat. It is unlawful to water ski from the period of one-half hour after sunset to one-half hour prior to sunrise.

J. **Diving:** No watercraft shall be operated within 150 feet of a diving flag, except for watercraft directly associated with the diving activity.

K. **Operating Under the Influence (OUI):** No person shall operate a watercraft while under the influence of alcohol or any other drug to the degree which renders him/her incapable of safely operating such watercraft, or who has any amount of a drug, substance, or compound in his/her blood or urine resulting from the unlawful use or consumption of cannabis as defined in the Cannabis Control Act or a controlled substance listed in the Illinois Controlled Substance Act.

L. **Unlawful Operation at Night:** No person shall operate a personal watercraft or a specialty prop craft between the hours of sunset and sunrise.

M Age of Operator:

1. No person under 10 years of age may operate a motorboat.
2. Persons at least 10 years of age and less than 12 years of age may operate a motorboat only if:
   a. they are accompanied on the motorboat and under the direct control of a parent or guardian, or a person at least 18 years of age designated by a parent or guardian.
3. Persons at least 12 years of age and less than 18 years of age may operate a motorboat only if:
   a. they are accompanied on the motorboat and under the direct control of a parent or guardian or
   b. a person at least 18 years of age designated by a parent or guardian or
   c. such motorboat operator is in possession of a Boating Safety Certificate issued by the Department of Natural Resources, Division of Education or a valid certificate issued by another state, a province of the Dominion of Canada, the United States Coast Guard Auxiliary or the United States Power Squardron.
4. Violations of this Section done with the knowledge of a parent or guardian shall be deemed a violation by the parent or guardian and punishable under Chp. 625 Art. 11A of the Illinois Boat Registration and Safety Act.

ARTICLE 6. BOAT ACCIDENT REPORTS

Whenever a boat is involved in a collision or accident causing injury or death to persons or property damage of $500, a report, completed by the operator, must be made to the Department.

All boating accidents which result in death or serious injury to any person shall be reported by the operator within 48 hours. All other accidents shall be reported within 5 days. The report will be confidential and without prejudice to the individual reporting. Forms for the reporting of accidents in the above categories may be obtained from your local Natural Resources Office or from the Central Office.

TDD: 217/782-9175
Ameritech Relay Number: 1-800-526-0844

ILLINOIS CONSERVATION POLICE REGION OFFICE LOCATIONS

LAKE MICHIGAN ENFORCEMENT
(Lake Michigan & Cook County)
701 NORTH POINT DRIVE
WINTHROP HARBOR, IL 60096
(847) 746-2854

REGION I
2612 LOCUST STREET
STERLING, IL 61081
(815) 625-2888

REGION II
110 JAMES ROAD
SPRING GROVE, IL 60081
(815) 675-2385

CENTRAL OFFICE
DEPT. OF NATURAL RESOURCES
OFFICE OF LAW ENFORCEMENT
524 SOUTH SECOND STREET
SPRINGFIELD, IL 62701
(217) 782-6431

REGION III
2005 ROUND BARN RD.
CHAMPAIGN, IL 61821
(217) 333-5773

REGION IV
4541 ALTON COMMERCE PKWY.
ALTON, IL 62002
(618) 462-1181

REGION V
11731 STATE HIGHWAY 37
BENTON, IL 62812
(618) 435-8138

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ILLINOIS boat REGISTRATION, TITLING & SAFETY ACT DIGEST

This brochure is only a guide to the highlights of the Illinois Boat Registration and Safety Act. The entire Act may be found in the Illinois Compiled Statutes, Chapter 625. More complete information is available from Department of Natural Resources Regional Offices or from Law Enforcement Division personnel. The information in this brochure is based on laws in effect as of January, 1996 and is subject to change.

TO REGISTER AND TITLE YOUR BOAT

You must submit a watercraft application, required documents and the appropriate fee. Applications are available from Natural Resource Regional offices, Conservation officers and boat dealers. If you have any questions regarding registration and titling, call: 217-782-2138. Credit card holders can renew their boat registration by calling:

1-800-867-3542
(1-800-TO-RELICENSE)

24 hours a day. Have your credit card, current registration certificate and a pen and paper ready before making the call.

— PREPARE —

Boat safety education is a positive move toward a safe and enjoyable boating future. Enroll in a Boat Safety Course now.

For information on class locations call:
1-800-832-2599

Illinois Department of Natural Resources

FINAL FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

Submitted to:

Mr. Brian Freeman
U.S. Environmental Protection Agency
Region 5 DE-9J
77 West Jackson Boulevard
Chicago, Illinois 60604

Submitted by:

TechLaw, Inc.
20 North Wacker Drive, Suite 1260
Chicago, Illinois 60606

EPA Work Assignment No.	**R05020**
Contract No.	**68-W4-0006**
TechLaw WAM	**Patricia Brown-Derocher**
Telephone No.	**312/345-8963**
EPA WAM	**Brian Freeman**
Telephone No.	**312/353-2720**

September 10, 1998

20 NORTH WACKER DRIVE, SUITE 1260, CHICAGO, IL 60606

TECHLAW INC.

PHONE: (312) 578-8900
FAX: (312) 578-8904

RZ2.R05020.01.ID.294

September 10, 1998

Mr. Brian Freeman
U.S. Environmental Protection Agency
Region 5 DE-9J
77 West Jackson Boulevard
Chicago, IL 60604

Reference: EPA Contract No. 68-W9-0006; EPA Work Assignment No. R05020; QAPP Development and Screening; Chemetco, Inc; EPA ID No. ILD048843809; Final Field Sampling and Analysis Report; Tasks 06 and 08 Deliverable

Dear Mr. Freeman:

Please find enclosed TechLaw's Final Field Sampling and Analysis Report (Final Report) for the Chemetco, Inc. facility in Hartford, Illinois. Also enclosed is an electronic version formatted in Word Perfect 6.1 for Windows on a 3.5 inch diskette. This Final Report replaces the draft Report submitted to U.S. EPA Region 5 on August 19, 1998.

Additional analytical testing of archived soil samples was requested by U.S. EPA through a Technical Directive Memorandum (TDM) dated July 15, 1998. The results of these analyses, as well as several minor text changes requested by Mr. Patrick Kuefler, the U.S. EPA Region 5 Technical Lead, have been incorporated into this Final Report.

If you have any questions, please contact me at (312) 345-8963.

Sincerely,

Patricia Brown-Derocher

Patricia Brown-Derocher
Regional Manager

cc: F. Norling, EPA Region 5, w/out attachments
P. Kuefler, EPA Region 5 (5 copies)
W. Jordan, Central Files
K. Higgins
Chicago Central Files

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FINAL FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

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FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

1.0 INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) Region 5 requested TechLaw, Inc. (TechLaw) to support the Agency in conducting sample collection at the Chemetco, Inc. (Chemetco) facility in Hartford, Illinois. This document constitutes the Field Sampling and Analysis Report for waste, soil, surface water, and sediment sampling performed by TechLaw at the Chemetco facility.

The sampling event occurred on May 28 and 29, 1998 and was undertaken in accordance with the Site-Specific Sampling and Analysis Plan (SAP) submitted to U.S. EPA on May 8, 1998. The SAP was used in conjunction with TechLaw's U.S. EPA-approved Region 5 Generic Quality Assurance Project Plan (QAPP) for Sampling Operations, dated January 1995. TechLaw utilized QST Environmental Laboratory (Gainesville, Florida), a TechLaw Team Subcontractor, to perform the analyses required under the SAP.

The sampling event was undertaken by TechLaw Field Team members Mr. Kevin Higgins, Mr. John Koehnen, Mr. Doug Updike, and Mr. Anthony Mubiru. Also present during the sampling event were Mr. Patrick Kuefler, U.S. EPA Region 5 and Mr. Chris Chanovsky, Illinois EPA (IEPA). Chemetco was represented during the sampling event by Cindy Davis and Heather Young of CSD Environmental Services (CSD), environmental consultant to the facility.

Maps showing the facility layout and sample locations are provided in Appendix A. A Photograph Log of the sampling event is provided in Appendix B, and Field Logs of all sampling activities are provided in Appendix C. Copies of the chain-of-custody forms are provided in Appendix D, investigation-derived waste manifests relating to the sampling event are provided in Appendix E, and a USGS topographic map showing the facility location is provided in Appendix F.

2.0 FACILITY DESCRIPTION

The Chemetco facility is located at the intersection of Illinois Route 3 and Oldenberg Road, in an industrial and agricultural area in Madison County, Illinois (Appendices A and F). Chemetco operations are conducted on an approximately 40-acre parcel of land surrounded by a chain link fence. Chemetco owns an additional 230 acres of land in the vicinity of the facility. The Chemetco facility is located in the floodplain of the Mississippi River in an area locally referred to as the American Bottoms.

The Chemetco facility was constructed in 1969 and initiated operations as a copper smelter in 1970 to derive copper and other non-ferrous metals and alloys from recyclable copper-bearing scrap and manufacturing residues. The Chemetco facility produces anode copper, cathode copper, and crude lead-tin solder. The facility generates four primary solid waste streams, which are waste slag, zinc oxide, baghouse dust, and spent refractory brick.

Waste slag at the Chemetco facility is generated from both water-cooled and air-cooled processes. File material indicates that slag is stored on-site in areas identified as "Units" (Appendix A). However, during the sampling effort, no distinct boundaries were observed separating the Units, and it appeared the facility managed a single continuous slag pile (Appendix A). Information obtained from the IEPA indicated that the slag had historically been shown to be high in total lead but EP Tox analysis in the 1980s found the slag to not exhibit a characteristic of a hazardous waste under EP Tox. Prior to the sampling effort reported here, it does not appear that the slag piles were analyzed directly to determine if the slag is characteristically hazardous for lead using the Toxicity Characteristic Leaching Procedure (TCLP) since TCLP became the required method of determining if a waste exhibited the characteristic of toxicity.

The facility operates a total of four baghouses to control air emissions from the various operations of the smelter and slag granulation processes (Appendix A). The facility has indicated to U.S. EPA that the baghouse dust is TCLP hazardous for lead and cadmium. Currently, the baghouse dust from all baghouses is reportedly transported off-site as hazardous waste. The four baghouses are designated as:

- No. 1 Baghouse;
- No. 2 Baghouse, also known as the "Roof Baghouse";
- Slag Granulation Plant, Primary Baghouse; and,
- Slag Granulation Plant, Secondary Baghouse.

Process wastewater generated from a venturi scrubber system is currently discharged to an open concrete tank for settling solids which are subsequently de-watered in a zinc oxide filter press. The filter cake from the press is described as zinc oxide. In the past, process wastewater was routed to lagoons for settling and subsequent de-watering of the residual solids. The resulting material was stored on-site in a zinc oxide pile which was later converted to a Zinc Oxide

Bunker. Currently, zinc oxide is staged in this location prior to off-site disposal. The facility has indicated to U.S. EPA that the zinc oxide material currently stored in the Zinc Oxide Bunker and the current zinc oxide generated at the facility are TCLP hazardous for lead and cadmium.

Spent refractory brick from smelting operations is currently generated and stored on-site. Up to five types of spent brick, of various compositions, are currently generated at an unspecified rate. Information obtained from the IEPA indicates that the spent refractory brick is TCLP hazardous for lead and cadmium.

3.0 SAMPLING AND ANALYSIS PROCEDURES

3.1 Waste Streams

The four primary waste streams of concern were characterized during the sampling effort: waste slag, zinc oxide, baghouse dust, and spent refractory brick. All sample numbers and sampling locations (Figure 2 in Appendix A) were determined under the direction of Mr. Kuefler.

Chemetco representatives collected split samples of all waste slag samples and spent refractory brick samples collected by TechLaw. Chemetco did not collect split samples of the zinc oxide or baghouse dust samples collected by TechLaw.

3.1.1 Waste Slag

A total of 20 waste slag samples were collected from the waste slag storage areas (e.g., "Units") and analyzed for RCRA TCLP metals. The total number of samples and the location of the sampling stations were determined in the field at the direction of Mr. Kuefler. In general, sampling locations were spread across the waste slag storage areas (Photos 1 through 19) and comprised waste slag pieces of various sizes from different elevations of the slag pile. In addition to the primary waste slag storage area (i.e., Unit 5) in the northwest corner of the Chemetco facility, waste slag was present across the facility in piles and in roadways (Photo 32).

Five waste slag samples were collected at the "Grizzly" slag hopper conveyors (Photos 1, 2, 3): SL-001, SL-002, SL-003, SL-004, SL-005. Each conveyor sorted the slag into distinct piles based on particle size. Four waste slag samples were collected from a large, excavated area in the vicinity of the waste slag pile (Photo 19): SL-011, SL-012, SL-013, and SL-014. Three waste slag samples were collected in the northeast portion of the waste slag pile: SL-018, SL-019, and SL-020. Eight waste slag samples were randomly collected along the slag roadway leading into the waste slag pile approximately every 75 feet: SL-006, SL-007, SL-008, SL-009, SL-010, SL-015, SL-016, and SL-017.

All waste slag samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl. Samples were collected as composites of

sampling locations except for samples SL-006 (Photo 5), SL-013 (Photo 13), and SL-014 (Photo 13) which were collected as discrete, samples of fine waste slag material. The composite samples were collected by sampling from at least three sub-areas within a sampling location. These locations were randomly chosen and were generally in the center of the sampling location. The composited materials were then homogenized to further aid in collection of representative samples.

At some locations, plastic bags were required for the collection of waste slag samples due to the inability to reduce the size of waste slag pieces to facilitate sample collection in 8-ounce, glass jars. The use of the plastic bags is a deviation from the SAP, but is not expected to have an impact on analytical results since inorganics are the constituents of concern.

3.1.2 Zinc Oxide

Four zinc oxide samples were collected from two areas of the facility and analyzed for RCRA total metals and RCRA TCLP metals. Three zinc oxide samples were collected from the Zinc Oxide Bunker (Photos 21 through 25): ZO-001, ZO-002, and ZO-003. One zinc oxide sample (ZO-004) was collected from a front-end loader at the filter press (Photos 26, 27) which had been filled directly from the wastes generated at the filter press on May 29, 1998.

The Zinc Oxide Bunker samples were collected in close proximity to the north portion of the bunker as the wet, un-compacted material represented a potential hazard in relation to collapsing. In addition, an air-purifying respirator (APR) was worn during sample collection.

All zinc oxide samples were collected as near-surface samples from a depth between zero and 6 inches below ground surface. All samples were collected with a stainless-steel spoon and were homogenized in a stainless-steel bowl.

3.1.3 Baghouse Dust

One baghouse dust sample was collected from each of the four baghouses: No. 1 Baghouse (Photo 28); the No. 2 Baghouse, also known as the "Roof Baghouse" (Photos 29, 30, 31); the Primary Baghouse of the Slag Granulation Plant (Photos 33, 34); and, the Secondary Baghouse of the Slag Granulation Plant (Photo 35). The samples were numbered consecutively from BD-001 through BD-004.

All zinc oxide samples were collected as discrete, samples from a depth between zero and 6 inches below the surface of the dust. All samples were collected with a stainless-steel spoon and were homogenized in a stainless-steel bowl. In addition, an APR was worn during sample collection.

3.1.4 Spent Refractory Brick

A total of six spent refractory brick samples were collected from several co-mingled spent refractory brick piles on the southeast side of the Zinc Oxide Bunker (Photos 36, 37, 38, 39, 40) and analyzed for RCRA TCLP metals.. Five brick types were selected in the field at the direction of Mr. Kuefler. The bricks were broken with a hammer and cold chisel to facilitate collection of representative samples and samples split by facility representatives.

A sixth sample was collected as a composite of smaller brick pieces in the pile. This composite sample was collected using a stainless-steel spoon and homogenized in a stainless-steel bowl.

Plastic bags were required for the collection of the spent refractory brick samples due to the inability to reduce the size of brick pieces to facilitate sample collection in 8-ounce, glass jars. The use of the plastic bags is a deviation from the SAP but is not expected to have an impact on analytical results since inorganics are the constituents of concern.

3.2 Soil

A total of 13 soil samples were collected in three general areas surrounding the facility: parking lot (toe area), former spent brick pile, and east runoff area. All soil samples were analyzed for RCRA total metals. Based upon a review of the RCRA total metals results, nine of the thirteen samples were also analyzed for cadmium and lead using the TCLP. Chemetco representatives collected split samples of all soil samples taken by TechLaw.

Four soil samples were collected from the parking lot (Photos 41, 42, 43, 44): SS-001, SS-002, SS-003, and SS-004. Four soil samples were collected from the former location of the spent brick pile to the south of the facility (Photos 45, 46, 47, 48): SS-005, SS-006, SS-007, and SS-008. Five soil samples were collected from the east runoff area located to the east and northeast of the waste slag pile (Photos 49, 50, 51, 52): SS-009, SS-010, SS-011, and SS-012. All sample locations were determined in the field at the direction of Mr. Kuefler.

In addition, three background soil samples were collected and analyzed for RCRA total metals to determine natural, background concentrations of inorganics in the vicinity of the Chemetco facility. One background soil sample was collected in the south wetland area (Photo 63), and two background soil samples were collected in a grassy open field in the area of a residence south of the facility across Long Lake (Photos 64, 65).

All soil samples were collected as near-surface samples from a depth between zero and 6 inches below ground surface. All samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl.

3.3 Surface Water and Sediment

A total of eight surface water and eight co-located sediment samples were collected from four different general areas of the facility property and were analyzed for RCRA total metals. Chemetco representatives collected split samples of all surface water and sediment samples obtained by TechLaw.

Three water/sediment samples were collected in the surface water body to the south of the facility identified as Long Lake (Photos 53, 54, 55): SW-001/SD-001, SW-002/SD-002, and SW-003/SD-003. Three water/sediment samples were collected in the south wetland area located to the south of the parking lot (Photos 56, 57, 58): SW-004/SD-004, SW-005/SD-005, and SW-006/SD-006. One water/sediment sample (SW-008/SD-008) was collected in the east runoff area (Photo 62) were it was observed that runoff from the waste slag pile was occurring and had accumulated in this area. One water/sediment sample was collected from a pond identified as a non-contact cooling water pond and stormwater pond within the fenced facility (Photos 59, 60, 61): SW-007/SD-007.

The surface water samples were collected either by directly dipping the sample container into the sampling location or by collecting water in a certified-clean, 8-ounce jar and transferring the water sample to the sample container. Field analytical parameters, including temperature, conductivity, turbidity, pH and dissolved oxygen (DO) were collected using a Horiba Water Quality Monitor. However, due to equipment malfunction, DO measurements are available only for surface water sampling locations SW-001 and SW-002.

All sediment samples were collected as discrete samples from a depth between zero and 6 inches below ground surface. All samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl.

3.4 Quality Control Samples

TechLaw personnel collected three types of Quality Assurance/Quality Control (QA/QC) samples: field duplicates, matrix spike/matrix spike duplicates (MS/MSD), and equipment rinsate blanks. One field duplicate was collected for every 10 environmental media samples collected per matrix. An MS/MSD sample was collected for every 20 environmental media samples collected per matrix.

One equipment rinsate blank was collected for every 10 samples collected which utilized the sampling equipment. The equipment blank was collected with certified de-ionized water provided by the contracted laboratory. The equipment blanks were collected from the decontaminated auger heads, a stainless steal spoon, and a stainless steel bowl (Photo 66).

During the course of the sampling event, seven field duplicates, nine MS/MSDs, and five equipment blanks were collected. All QA/QC samples were handled in the same manner described above for the environmental media sampling.

3.5 Sample Custody and Shipment

All sample containers and sample bags were appropriately labeled and tagged in accordance with TechLaw's U.S. EPA-approved Region 5 Generic QAPP. A chain-of-custody (COC) form (Appendix D) accompanied the samples from the point of origin to the analytical laboratory. All samples collected by TechLaw remained in the custody of the TechLaw Sampling Team until shipment to QST Environmental (Gainesville, Florida). All samples were shipped overnight via Federal Express on June 1, 1998. All samples were received by QST Environmental on June 2, 1998 with custody seals intact, as identified in the QST Cooler Receipt Form (Appendix D).

3.6 Data Validation

Analytical data generated by QST Environmental was provided to TechLaw in conformance with Contract Laboratory Program (CLP)-like reporting protocols. All analytical data were validated by a member of the TechLaw Team, independent of the sampling team, utilizing the *Functional Guidelines for Inorganic Data Validation*. Specific data package and data validation procedures are outlined in TechLaw's U.S. EPA-approved Region 5 Generic QAPP.

3.7 Decontamination and Waste Management

All sampling equipment used in the sampling effort was decontaminated before the sampling event and between sample locations using an Alconox® soap wash, a tap water rinse, and a deionized water rinse. Sampling equipment utilized in this effort included stainless-steel spoons, auger heads, and stainless steel bowls.

All investigation-derived waste (IDW), including the decontamination water and all personal protective equipment (PPE), was accumulated in two, 55-gallon, steel drums which were staged on a pad in a secured area on southeast portion of the Chemetco facility property. The staging of the drums was undertaken per the direction of facility representatives from CSD.

A U.S. EPA Identification Number (ILP200000130) and State Of Illinois Identification Number (1198015008) were acquired to allow for the management of the two drums of IDW. Manifests were completed for the two drums of IDW and were signed by Mr. Kuefler, U. S. EPA (Appendix E). The drums were labeled hazardous for RCRA TCLP metals, minus mercury. The drums of IDW were transported by Heritage Transport (IND058484114) on May 29, 1998 to Heritage Environmental Services (IND093219012), a permitted treatment, storage, and disposal (TSD) facility. The two drums of IDW were received by Heritage Environmental Services on June 6, 1998.

4.0 ANALYTICAL RESULTS

4.1 Waste Streams

Analytical results of the waste stream sampling effort are presented in Table 4.1.1. through Table 4.1.4. Undetected constituents are flagged "U" with a corresponding detection limit. Estimated values are flagged "J".

4.1.1 Waste Slag

Analytical results of the waste slag RCRA TCLP metals analysis are presented in Table 4.1.1. All 20 waste slag samples contained TCLP lead concentrations above the regulatory limit of 5 mg/L. Two waste slag samples (SL-014, SL-018) contained TCLP cadmium concentrations above the regulatory limit of 1 mg/L, and waste slag sample (SL-002) is near the cadmium TCLP regulatory limit. No waste slag samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver.

With regards to the waste slag TCLP lead results, statistical calculations were performed on the reported concentrations with the following results (mg/L):

Mean	35.2
Standard Error	4.52
Median	32.75
Standard Deviation	20.23
Sample Variance	409.45
Range	68.1
Minimum Value	11.8
Maximum Value	79.9
Confidence Level (95%)	9.47

The confidence level of the mean (9.47 mg/L) indicates that 95 percent of all TCLP lead results are between 25.7 and 44.7 mg/L (35.2 mg/L +/- 9.47 mg/L). The lower confidence limit of the mean statistically provides an estimate of the minimum value of 95 percent of the slag material which was characterized. The confidence level indicates that 95 percent of the slag pile area which was characterized has a TCLP lead concentration of at least 25.7 mg/L, which is over five times the regulatory limit (5 mg/L). Thus, while 100 percent of the samples are at least two times the regulatory limit (minimum value 11.7 mg/L), over 95 percent of the samples were statistically characterized as over five times the regulatory limit.

Table 4.1.1
Waste Slag TCLP Metal Concentrations
(mg/L)

RCRA Metal	SL-001	SL-002	SL-003	SL-004	SL-005	SL-006	SL-007	SL-008	SL-009	SL-010
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.7	1.6	1.0	0.9	0.4	1.7	1.6	1.2	1.4	1.8
Cadmium	0.16	0.93	0.50	0.58	0.01	0.51	0.66	0.16	0.39	0.32
Chromium	0.040	0.027	0.050	0.033	0.015	0.076	0.042	0.028	0.044	0.030
Lead	18.4	16.6	11.8	15.4	20.5	39.2	56.6	14.6	79.9	27.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0:0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

RCRA Metal	SL-011	SL-012	SL-013	SL-014	SL-015	SL-016	SL-017	SL-018	SL-019	SL-020
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.8	2.7	0.6	0.6	1.7	1.8	0.8	0.8	0.8	0.7
Cadmium	0.21	0.18	0.64	1.11	0.44	0.25	0.01	1.32	0.09	0.23
Chromium	0.031	0.017	0.037	0.058	0.033	0.130	0.020	0.022	0.042	0.030
Lead	54.4	17.2	43.9	50.6	56.0	21.0	38.2	67.7	37.8	17.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0:005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005

4.1.2 Zinc Oxide

Analytical results for zinc oxide samples RCRA total metal concentrations are presented in Table 4.1.2a, and analytical results of zinc oxide samples RCRA TCLP metal concentrations are presented in Table 4.1.2b. All zinc oxide TCLP samples are above the regulatory limit for lead (5 mg/L) and cadmium (1 mg/L).

The lead sampling results indicate differences between the zinc oxide filter press sample (ZO-004) and the Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003). The total lead concentration of the zinc oxide filter press sample (ZO-004) is 25,400 mg/L, which is 16 percent less than the mean of the total lead concentrations of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 30,066.7 mg/L. However, the TCLP lead concentration of the zinc oxide filter press sample (ZO-004) is 213 mg/L which is 700 percent higher than the mean of the of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 30.3 mg/L.

The cadmium sampling results indicate a difference between the zinc oxide filter press sample (ZO-004) and the Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003).
The total cadmium concentration of the zinc oxide filter press sample (ZO-004) is 3,010 mg/L, which is 31 percent higher than the mean of the total cadmium concentrations of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 2291 mg/L. The TCLP cadmium concentration of the zinc oxide filter press sample (ZO-004) is 23.7 mg/L which is 60 percent higher than the mean of the of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 14.8 mg/L.

No zinc oxide samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver. No significant differences between the zinc oxide filter press sample and the Zinc Oxide Bunker samples were noted with regard to arsenic, barium, chromium, mercury, selenium, or silver.

Table 4.1.2a
Zinc Oxide
Total Metal Concentrations
(mg/kg)

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	359	193 U	110 U	130 U
Barium	1190	1580	3100	1280
Cadmium	2890	3280	704	3010
Chromium	100	56.6	50.4	76.9
Lead	40000	32000	18200	25400
Mercury	15.9 J	30.3 J	3.61 J	20.7 J
Selenium	198 U	193 U	110 U	130 U
Silver	43.70	55.50	25.80	105

Table 4.1.2b
Zinc Oxide
TCLP Metal Concentrations
(mg/L)

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.5	0.3	0.6	0.6
Cadmium	22.50	13.40	8.38	23.70
Chromium	0.010 U	0.010 U	0.010 U	0.010 U
Lead	8.5	23.8	58.8	213.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0005 J
Selenium	1.000 U	2.000 U	0.500 U	1.000 U
Silver	0.050 U	0.100 U	0.005 U	0.050 U

4.1.3 Baghouse Dust

Analytical results of baghouse dust samples for RCRA TCLP metals are presented in Table 4.1.3. All baghouse dust samples were above the TCLP regulatory limit for lead (5 mg/L) and cadmium (1 mg/L).

The TCLP lead concentrations range from 835 mg/L for the No. 1 Baghouse (BD-001) to 27.4 mg/L for the No. 2 Baghouse/Roof Baghouse (BD-002). The Primary Baghouse of the Slag Granulation Plant (BD-003) and the Secondary Baghouse of the Slag Granulation Plant (BD-004) have TCLP lead concentrations of 89.5 mg/L and 48.3 mg/L, respectively.

The TCLP cadmium concentrations range from 56.0 mg/L for the Secondary Baghouse of the Slag Granulation Plant (BD-004) to 7.97 mg/L for the Primary Baghouse of the Slag Granulation Plant (BD-003). The No. 1 Baghouse (BD-001) and the No. 2 Baghouse/Roof Baghouse (BD-002) have TCLP cadmium concentrations of 36.9 mg/L and 54 mg/L, respectively.

No baghouse dust samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver. No significant differences between the baghouse dust samples were noted with regard to arsenic, barium, chromium, mercury, selenium, or silver.

Table 4.1.3
Baghouse Dust
TCLP Metal Concentrations
(mg/L)

RCRA Metal	BD-001	BD-002	BD-003	BD-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.2	0.1	0.3	0.1
Cadmium	36.90	54.00	7.97	56.00
Chromium	0.010 U	0.037	0.010 U	0.010 U
Lead	835	27.4	89.5	48.3
Mercury	0.0006 J	0.11 J	0.0016 J	0.0002 J
Selenium	2.000 U	10.00	0.800 U	0.600 U
Silver	0.100 U	0.500 U	0.005 U	0.005 U

4.1.4 Spent Refractory Brick

Analytical results of spent refractory brick samples for RCRA TCLP metals are presented in Table 4.1.4. Two brick samples (RB-001 and RB-006) are above the TCLP regulatory limit for both lead
(5 mg/L) and cadmium (1/mg/L). All other brick samples are below the TCLP regulatory limits for all RCRA metals.

Brick sample RB-006, with high TCLP lead (6.7 mg/L) and cadmium (1.35 mg/L), represents a composite sample of three areas of brick pieces and associated brick pile material. The material composited for RB-006 represented a visibly significant portion of the spent refractory brick pile (Photos 36, 37).

Table 4.1.4
Spent Refractory Brick
TCLP Metal Concentrations
(mg/L)

RCRA Metal	RB-001	RB-002	RB-003	RB-004	RB-005	RB-006
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	1.0	0.2	0.2	0.5	0.2	1.2
Cadmium	2.21	0.005 U	0.005 U	0.005 U	0.005 U	1.35
Chromium	0.066	0.010 U	2.020	0.010 U	0.852	0.010 U
Lead	33.0	0.1	0.050 U	0.050 U	0.050 U	6.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

4.2 Soil

4.2.1 Parking Lot Soil

The parking lot soil results (Table 4.2.1) indicate high levels of lead and cadmium when compared to the background soil (Table 4.2.4) which contains low mean concentrations of lead (74.6 mg/kg) and cadmium (1.49 mg/kg). One sample, SS-004, contains a significant concentration of chromium when compared to background. However, no significant comparisons with background results were noted with regard to arsenic, barium or mercury.

During the sampling event, the parking lot soil samples were observed to contain a mix of slag, soil, gravel, concrete, refractory brick and sand, and the results indicate high lead levels similar to the slag results. The parking lot soil results range from 2,300 mg/kg to 23,200 mg/kg with a mean concentration of 8,518 mg/kg. All samples contain a minimum of 30 times the mean background lead concentration and are a minimum of nearly six times the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead. One sample, SS-003 (Photo 43), contains a lead level of 23,200 mg/kg, which is 310 times background and 58 times the 400 mg/kg IEPA Industrial clean-up level.

The parking lot soil results indicate a minimum of 18 times the mean background cadmium concentration. However, no samples are above the 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective for cadmium.

One sample, SS-003, contains a total chromium concentration of 488 mg/kg, which is nearly 13 times the mean background soil concentration. This sample also contains a total silver concentration of 40.4 mg/kg which is over 60 times the mean detection limit for silver in background.

All four parking lot soil results are above the TCLP regulatory limit for lead (5 mg/L), the IEPA Tiered Approach to Cleanup Objectives (TACO) Migration to Groundwater Route Value for Class I Aquifers (0.0075 mg/L) and the IEPA TACO Migration to Groundwater Route Value for Class II Aquifers (0.1 mg/L). The mean lead concentration for the four samples is 20.1 mg/L, which is over four times the TCLP regulatory limit.

The parking lot soil results for two samples (SS-001 and SS-004) are above the TCLP regulatory limit for cadmium (1 mg/L). All four soil results are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.005 mg/L) as well as the Class II Aquifers value (0.05 mg/L). The mean cadmium concentration is 1.2 mg/L which is 20 percent higher than the TCLP regulatory limit.

Although contaminant concentration comparisons to the various TACO remediation values are provided, the appropriate remediation standards for the site, considering all the necessary site-specific factors, have not been determined at the time of this report.

Table 4.2.1a
Parking Lot Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	SS-001	SS-002	SS-003	SS-004
Arsenic	24.7	68.1 U	200 U	22.1
Barium	310	481	253	173
Cadmium	51.40	27.50	30.80	46.60
Chromium	21.4	37.7	488	38.8
Lead	3880	2300	23200	4690
Mercury	0.459 J	0.199 J	0.46 J	0.399 J
Selenium	16.40	68.1 U	200 U	20.40
Silver	1.90	3.4 U	40.40	0.97

Table 4.2.1b
Parking Lot Soil
TCLP Metals Concentrations
(mg/L)

RCRA Metal	SS-001	SS-002	SS-003	SS-004
Cadmium	1.67	0.74	0.79	1.64
Lead	26.5	11.5	22.7	20.3

4.2.2 Former Brick Pile Soil

The former brick pile soil sample results (Table 4.2.2) indicate high levels of lead and cadmium when compared to the background soil (Table 4.2.4). During the sampling effort, the former brick pile soil samples were described as being a dark-brown, silty-sand with some clay.

The former brick pile soil lead results range from 639 mg/kg to 8,510 mg/kg with a mean concentration of 3,720 mg/kg, which is 50 times greater than the mean background lead concentration. All sample concentrations are above the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead.

The former brick pile soil cadmium results range from 5.91 mg/kg to 60.10 mg/kg with a mean concentration of 31.2 mg/kg, which is 21 times grater than the mean background cadmium

concentration. However, no samples were above the 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective for cadmium.

Two samples, SS-007 and SS-008, contained silver concentrations of 16.3 mg/kg and 14.0 mg/kg, respectively. These concentrations are a minimum of 23 times greater than the mean detection limit for the undetected values for silver in the background samples.

No significant comparisons with background soil results were noted with regard to arsenic, barium, chromium or mercury for any of the former brick pile soil sample results.

Three of the former brick pile soil samples were submitted for TCLP analysis for cadmium and lead. All three samples exhibit lead concentrations above the TCLP regulatory limit (5 mg/L), the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.0075 mg/L) and the IEPA TACO Migration to Groundwater Route Value for Class II Aquifers (0.1 mg/L). The mean lead concentration for the three samples is 18.0 mg/L, which is over three times the TCLP regulatory limit.

None of the former brick pile soil results are above the TCLP regulatory limit for cadmium (1 mg/L). However, all three soil results are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.005 mg/L) as well as the TACO Class II Aquifers value (0.05 mg/L). The mean cadmium concentration is 0.70 mg/L.

Although contaminant concentration comparisons to the various TACO remediation values are provided, the appropriate remediation standards for the site, considering all the necessary site-specific factors, have not been determined at the time of this report.

Table 4.2.2a
Former Brick Pile Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	SS-005	SS-006	SS-007	SS-008
Arsenic	14.9	17.6	46.2	131 U
Barium	194	260	261	482
Cadmium	5.91	13.90	60.10	45.00
Chromium	11.5	19.1	20.8	31.4
Lead	639	2450	3280	8510
Mercury	0.076 J	0.102 J	0.255 J	0.412 J
Selenium	11.5 U	11.20	12.30	131 U
Silver	0.6 U	2.51	16.30	14.00

Table 4.2.2b
Former Brick Pile Soil
TCLP Metals Concentrations
(mg/L)

RCRA Metal	SS-005	SS-006	SS-007	SS-008
Cadmium	N/A	0.30	0.99	0.73
Lead	N/A	14.2	16.1	23.7

N/A = Not analyzed as directed by U.S. EPA Region 5

4.2.3 East Runoff Area Soil

The distribution of the east runoff soil sample results (Table 4.2.3) indicate higher concentrations of lead and cadmium directly east of the facility (SS-009, SS-010, SS-011) when compared to the soil samples collected to the northeast of the facility (SS-012, SS-013). The three samples to the east (SS-009, SS-010, SS-011) also contain high levels of lead and cadmium when compared to the background soil (Table 4.2.4).

The lead results for SS-009, SS-010, and SS-011 range from 359 mg/kg to 2,380 mg/kg with a mean concentration of 1,286 mg/kg, which is 17 times greater than the mean lead background concentration. Two of the samples (SS-009, SS-010) are above the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead. These samples (SS-009, SS-010) were taken in close proximity to surface water sample location SW-008 and sediment sample location SD-008 which contained visible surface runoff from the slag pile storage area (Photo 62) (see Section 4.3.3 below).

The cadmium results for SS-009, SS-010, and SS-011 range from 4.96 mg/kg to 18.80 mg/kg with a mean concentration of 13.25 mg/kg, which is nine times greater than the mean background level. However, no samples were above the 39 mg/L IEPA Tier 1 Residential soil clean-up objective, or the 1,000 mg/kg Industrial soil clean-up objective.

No significant comparisons with background soil results were noted for SS-012 and SS-013 located to the northeast of the facility. In addition, no significant comparisons with background were noted for arsenic, barium, chromium, mercury, or silver for any of the east runoff area results.

Two of the east runoff area soil samples were submitted for TCLP analysis for cadmium and lead. Neither sample exhibits lead concentrations above the TCLP regulatory limit (5 mg/L). However, both reported concentrations are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.0075 mg/L) and the IEPA TACO Migration to Groundwater Route Value for Class II Aquifers (0.1 mg/L). The mean lead concentration for the two samples is 1.3 mg/L.

Neither of the east runoff area soil cadmium results are above the TCLP regulatory limit (1 mg/L).

However, both soil results are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.005 mg/L) as well as the TACO Class II Aquifers value (0.05 mg/L). The mean cadmium concentration is 0.15 mg/L.

Although contaminant concentrations comparisons to the various TACO remediation values are provided, the appropriate remediation standards for the site considering all the necessary site-specific factors have not been determined at the time of this report.

Table 4.2.3a
East Runoff Area Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	SS-009	SS-010	SS-011	SS-012	SS-013
Arsenic	21.1	24.1	13.7	14.1	10.8 U
Barium	265	549	282	250	244
Cadmium	18.80	16.00	4.96	2.95	2.12
Chromium	14.40	25.7	14.8	12.8	11.1
Lead	1120	2380	359	179	124
Mercury	0.127 J	0.191 J	0.075 J	0.048 J	0.037 J
Selenium	11.7 U	15.40	9.6 U	9.8 U	10.8 U
Silver	1.11	0.70	0.5 U	0.5 U	0.5 U

Table 4.2.3b
East Runoff Area Soil
TCLP Concentrations
(mg/L)

RCRA Metal	SS-009	SS-010	SS-011	SS-012	SS-013
Cadmium	0.19	0.12	N/A	N/A	N/A
Lead	1.41	1.10	N/A	N/A	N/A

N/A = Not analyzed as directed by U.S. EPA Region 5

4.2.4 Background Soil

Background soil results (Table 4.2.4) indicate a notable difference between the concentration of lead in the south wetland area background sample (BK-001) and the residential soil background samples

(BK-002, BK-003). However, no other differences are noted between the three samples or with any of the other RCRA metals.

The south wetland area background sample contained a lead concentration of 112 mg/kg which is two times the mean concentration of the two residential background samples (BK-002, BK-003). It is possible to conclude that the location of BK-001 may have been impacted by surface runoff from the parking lot area. However, the lead concentration in BK-001 is relatively low when compared to the other soil samples (SS-001 through SS-013) and is nearly one-quarter of the IEPA soil clean-up objective. Thus, BK-001 is included in the calculation of the mean soil lead background level and could still be considered a representative background location

Table 4.2.4
Background Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	BK-001	BK-002	BK-003	Mean
Arsenic	17.9	16.6	15.4	16.6
Barium	193.0	242.0	247.0	227.3
Cadmium	1.82	1.29	1.36	1.49
Chromium	18.6	79.0	16.1	37.9
Lead	112.0	55.5	56.3	74.6
Mercury	0.071 J	0.037 J	0.033 J	0.047 J
Selenium	13.2 U	12.3 U	9.7 U	11.7 U
Silver	0.7 U	0.6 U	0.5 U	0.6 U

4.3 Surface Water and Sediment

Analytical results for the surface water and co-located sediment samples are presented in Table 4.3.1 through Table 4.3.4. The sample results are grouped according to the four areas which were sampled: Long Lake, south wetland area, east runoff area, and the non-contact cooling water pond.

4.3.1 Long Lake

The surface water and sediment sample results (Table 4.3.1) for Long Lake indicate that the sediments of the water body contain high levels of lead and cadmium when compared to background soil samples. However, the surface water samples contained no notable

concentrations of metals, and the sediment samples contain no notable concentrations of arsenic, barium, chromium, mercury, selenium, or silver.

Sediment samples (SD-001, SD-002, SD-003) contain a mean lead concentration of 712 mg/kg which is 10 times greater than the mean lead soil background concentration. All three samples are near or above the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead.

Sediment samples (SD-001, SD-002, SD-003) contained cadmium concentrations which are notably higher than all soil samples which were collected (Tables 4.2.1, 4.2.2, 4.2.3). The sediment samples contain a mean cadmium concentration of 324 mg/kg, which is 217 times greater than the mean cadmium soil background concentration. All three sediment samples are above the 39 mg/kg IEPA Tier 1 Residential soil clean-up objective for cadmium, but below the 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective for cadmium.

Although contaminant concentration comparisons to the various TACO soil remediation values are provided, they may not be appropriate remediation values for sediments. The appropriate remediation standards for the site, considering all necessary site-specific factors, have not been determined at the time of this report.

The surface water samples contained no notable levels of RCRA metals. However, during the sampling event, the water body was observed to be relatively still with no visible flow. The low dissolved oxygen levels (mean 3.8 mg/L) and relatively low turbidity (mean 53 NTU) suggest that there may be minimal mixing and dispersion of sediment contamination which may explain the lower levels of inorganic contamination noted in the surface water samples.

Table 4.3.1
Long Lake
Surface Water and Sediment Total Metal Concentrations

	Surface Water (μg/L)			Sediment (mg/kg)		
RCRA Metal	**SW-001**	**SW-002**	**SW-003**	**SD-001**	**SD-002**	**SD-003**
Arsenic	100 U	100 U	100 U	23.9 U	18.9 U	15.2 U
Barium	83.0	78.2	83.8	225	210	239
Cadmium	12.40	9.90	9.40	566	308	98.10
Chromium	10.0 U	10.0 U	10.0 U	14	14.4	16.4
Lead	50.0 U	50.0 U	50.0 U	1100	383	652
Mercury	0.20 UJ	0.20 UJ	0.20 UJ	0.38 J	0.261 J	0.148 J
Selenium	100 U	100 U	100 U	23.9 U	18.9 U	15.2 U
Silver	5.0 U	5.0 U	5.0 U	1.94	0.90 U	1.63

Temperature (°C)	24.2	24.9	28.5
Conductivity (μS/cm)	0.468	0.485	0.612
Turbidity (NTU)	50	70	40
Dissolved O_2 (mg/L)	3.6	4.0	Not Available
pH	6.89	7.33	8.06

4.3.2 South Wetland Area

The surface water and sediment sample results (Table 4.3.2) for the south wetland area indicate that the area contains high levels of lead and cadmium. However, the surface water and sediment of the area contain no notable concentrations of arsenic, barium, chromium, mercury, selenium, or silver.

The surface water samples (SW-004, SW-005, SW-006) contain a mean lead concentration of 9,194 μg/L, and the sediment samples (SD-004, SD-005, SD-006) contain a mean lead concentration of 270 mg/kg, which is nearly four times greater than the mean soil background concentration.

The surface water samples contain a mean cadmium concentration of 291μg/L, which is 27 times the mean cadmium concentration for the surface water samples of Long Lake (mean 10.5 μg/L). Cadmium concentrations in sediments were a minimum of three times the mean soil background concentration.

The surface water in this area exhibited high conductivities, which were all above 2.0 μS/cm. A relatively high turbidity (337 NTU) is noted for SS-004 and maybe related to the depth of the water at this location (Photo 56).

Table 4.3.2
South Wetland Area
Surface Water and Sediment Total Metal Concentrations

	Surface Water (μg/L)			Sediment (mg/kg)		
RCRA Metal	**SW-004**	**SW-005**	**SW-006**	**SD-004**	**SD-005**	**SD-006**
Arsenic	100 U	100 U	153.0	19.1	22.4 U	18.8 U
Barium	1110.0	154.0	2150.0	201.0	246.0	214.0
Cadmium	467.00	54.20	352.00	8.69	6.95	4.65
Chromium	52.1	10.0 U	104.0	18.2	17.0	16.7
Lead	12500.0	481.0	14600.0	298.0	433.0	79.8
Mercury	105 J	0.20 UJ	1.83 UJ	0.057 J	0.102 J	0.07 J
Selenium	100 U	100 U	107.00	17.8 U	22.4 U	14.8 U
Silver	16.5	5.0 U	45.10	0.9 U	1.1 U	0.7 U
Temperature (°C)	26.5	28.5	24.7			
Conductivity (μS/cm)	2.06	2.59	2.06			
Turbidity (NTU)	337	24	45			
pH	8.22	8.19	8.09			

4.3.3 East Runoff Area

The surface water and sediment sample results (Table 4.3.3) for the east runoff area indicate that runoff from the waste slag pile (Photo 62) contains high lead concentrations and relatively high cadmium concentrations when compared to background. However, this area exhibits no notable concentrations of the other RCRA metals.

The lead concentration of 1,490 mg/kg is nearly four times the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective and nearly 20 times higher than the mean background concentration of 74.6 mg/kg for lead. The cadmium concentration of 8.69 is nearly six times background, however this concentration is well below the 39 mg/kg IEPA Tier 1 Residential soil clean-up objective and 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective.

Although contaminant concentration comparisons to the various TACO soil remediation values are provided, they may not be appropriate remediation values for sediments. The appropriate remediation standards for the site, considering all the necessary site-specific factors, have not been determined at the time of this report.

Surface water at this sample location exhibited an extremely high conductivity (20 μS/cm) and pH (11.7). The high turbidity (181 NTU) may be related to the depth of the water at this location (Photo 62).

Table 4.3.3
East Runoff Area
Surface Water and Sediment Total Metal Concentrations

	Surface Water (μg/L)	Sediment (mg/kg)
RCRA Metal	**SW-008**	**SD-008**
Arsenic	100 U	12.6 U
Barium	494.0	313.0
Cadmium	19.7	8.69
Chromium	82.8	23.8
Lead	4350.0	1490.0
Mercury	3.65 J	0.08 J
Selenium	294.00	12.6 U
Silver	5.0 U	0.6 U

Temperature (°C)	20.0
Conductivity (μS/cm)	20.8
Turbidity (NTU)	181
pH	11.7

4.3.4 Non-Contact Cooling Water Pond

The surface water and sediment sample results (Table 4.3.4) for the non-contact cooling water pond indicate high lead and cadmium concentrations. However, the surface water and sediment at this sample location exhibit no notable concentrations of the other RCRA metals.

Surface water at this sample location exhibited an extremely high conductivity (29.5 μS/cm) and pH (10.34). The low turbidity (36 NTU) suggests the high surface water lead and cadmium concentrations may not be related to high suspended solids.

Table 4.3.4
Non-Contact Cooling Water Pond
Surface Water and Sediment Total Metal Concentrations

	Surface Water (μg/L)	Sediment (mg/kg)
RCRA Metal	**SW-007**	**SD-007**
Arsenic	100 U	167.0
Barium	76.8	2430.0
Cadmium	405.00	3450.0
Chromium	12.9	110.0
Lead	9040.0	22600.0
Mercury	8.28 J	8.45 J
Selenium	348.00	144 U
Silver	5.0 U	62.80

Temperature (°C)	33.6
Conductivity (μS/cm)	29.5
Turbidity (NTU)	36
pH	10.34

5.0 DATA VALIDATION

5.1 Total Metals Data Validation

No analytical results/data reported for any of the media were rejected during the data validation. A total of 360 analytical results for total metals were reported for the sampling effort. Of these results, 232 were reported at a concentration above the method detection limit, and 128 were reported as undetected (U). Estimated concentrations (J) were identified only for the mercury results.

The samples were analyzed in four sample delivery groups (SDGs). The data packages for the SDGs contained all documentation and data necessary to conduct a complete quality assurance review (e.g., data validation).

Completeness

The results reported by the laboratory were 100-percent complete and legible. No data were rejected and all data are useable as reported.

Holding Times

Analytical holding times were assessed to determine whether the holding time requirements were met by the laboratory. Holding times were met for all analytes, except mercury. All values for mercury were qualified as estimated and flagged "J".

Method Blank Analyses

No analytes were detected in the laboratory or field blanks at concentrations greater than two times the method detection limit.

Calibration

Initial calibration, continuing calibration verification, contract-required detection limit standards, and continuing calibration blank analyses met the criteria for acceptable performance and frequency of analysis for all total metals.

Interference Check Samples for ICP Analyses

All interference check sample results met the criteria for acceptable performance and frequency of analysis.

Accuracy

The accuracy of the analytical results were evaluated in terms of analytical bias by assessing Laboratory Control Samples (LCSs) and matrix spike recoveries and in terms of precision by assessing laboratory duplicates.

Laboratory Control Sample Recoveries

The recoveries for all LCSs and the frequency of analysis met the criteria for acceptable performance.

Matrix Spike Recoveries

The recoveries for all matrix spike samples and the frequency of analysis met the criteria for acceptable performance. For one SDG (SDG G91185), several target analyte results were outside the percentage control limit range and not within criteria acceptance. However, the original sample concentrations in these instances were more than four times the spike concentrations and the sample results did not require qualification.

Precision

The results for all duplicate sample analyses and the frequency of analysis met the criteria for acceptable performance.

Serial Dilution of Samples for ICP Analyses

All serial dilution results for the samples analyses met the criteria for acceptable performance and frequency of analysis.

Analyte Quantification and Method Detection Limits

The calculation for analyte quantification and method detection limits were acceptable for all target analytes.

Field Quality Control

The results for all field quality control samples associated with the sampling effort were acceptable.

Equipment Rinsate Blanks

No target analytes were detected in the field equipment blanks.

Field Duplicates

The precision for field duplicate analysis was acceptable and most of the relative percentage difference results were less than or equal to 35 percent.

Sample Result Verification

Raw data were examined for anomalies, transcription errors, and reduction errors. Sample results were examined for calculation errors to ensure that the reported results were accurate. All reported values were found to be acceptable.

5.2 TCLP Metals Data Validation

No reported data were rejected or qualified during the data validation for the additional analysis requested by U.S. EPA. A total of nine analytical results for TCLP lead and nine analytical results for TCLP cadmium were reported for the sampling effort with all 18 results being reported at a concentration above the method detection limit. The samples were analyzed in one sample delivery group (SDG) with the SDG containing all documentation and data necessary to conduct a complete quality assurance review.

Completeness

The results reported by the laboratory were 100-percent complete and legible. No data were rejected and all data are useable as reported.

Holding Times

Analytical holding times were assessed to determine whether the holding time requirements were met by the laboratory. Holding times were met for all analytes.

Method Blank Analyses

No analytes were detected in the laboratory or field blanks at concentrations greater than two times the method detection limit.

Calibration

Initial calibration, continuing calibration verification, contract-required detection limit standards, and continuing calibration blank analyses met the criteria for acceptable performance and frequency of analysis for all total metals.

Interference Check Samples for ICP Analyses

All interference check sample results met the criteria for acceptable performance and frequency of analysis.

Accuracy

The accuracy of the analytical results were evaluated in terms of analytical bias by assessing Laboratory Control Samples and matrix spike recoveries and in terms of precision by assessing laboratory duplicates.

Laboratory Control Sample Recoveries

The recoveries for all LCSs and the frequency of analysis met the criteria for acceptable performance.

Matrix Spike Recoveries

The recoveries for all matrix spike samples and the frequency of analysis met the criteria for acceptable performance. Results of matrix spike and matrix spike duplicate were outside the percentage control limit range and not within criteria acceptance. However, the original sample concentrations in these instances were greater than four times the spike concentrations. Therefore, the results did not require qualification.

Precision

The results for all duplicate sample analysis and the frequency of analysis met the criteria for acceptable performance.

Serial Dilution of Samples for ICP Analyses

All serial dilution results for the samples analyses met the criteria for acceptable performance and frequency of analysis.

Analyte Quantification and Method Detection Limits

The calculation for analyte quantification and method detection limits were acceptable for all target analytes.

Field Quality Control

The results for all field quality control samples associated with the sampling effort were acceptable.

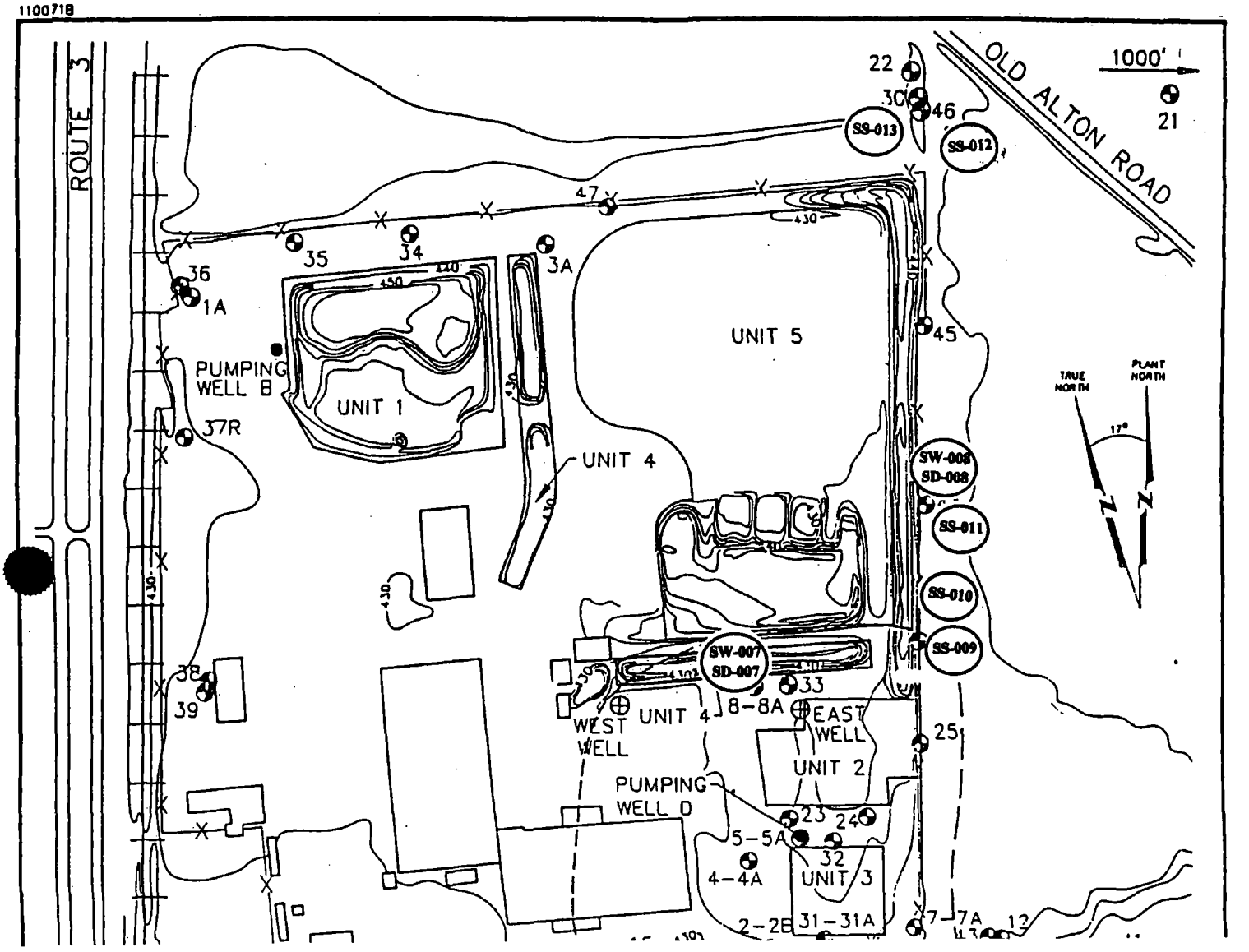
APPENDIX A

FACILITY LAYOUT AND SAMPLE LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

1100718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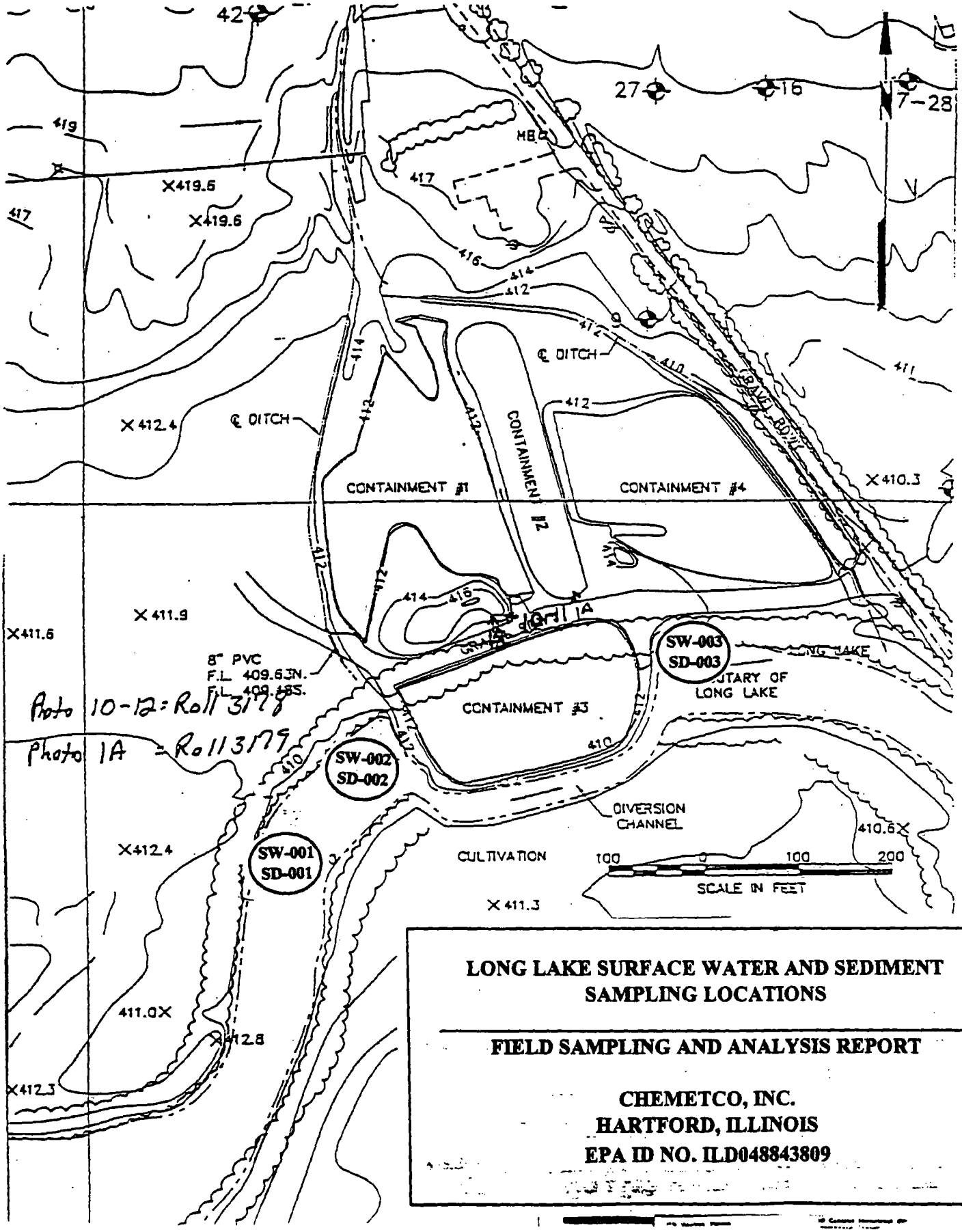
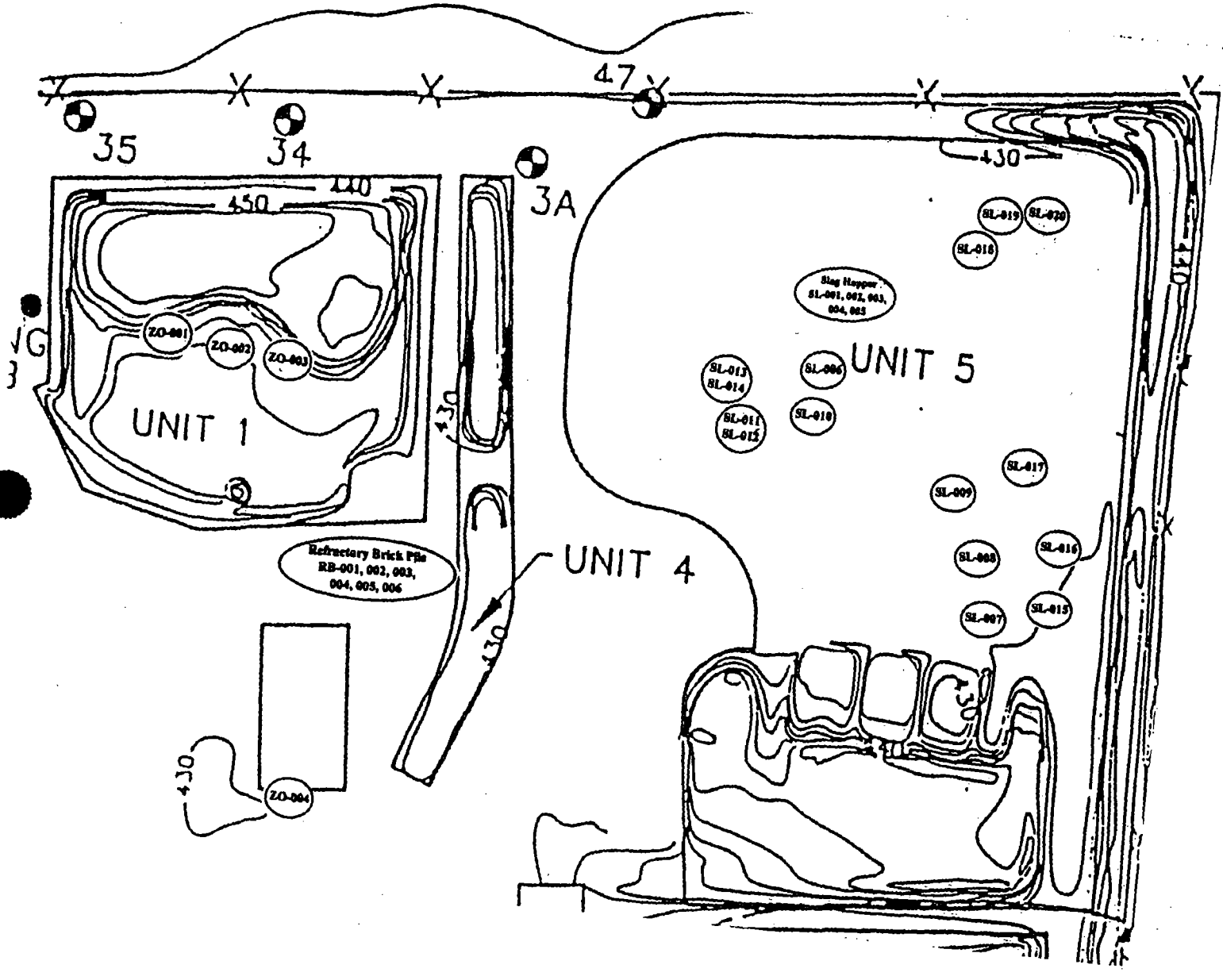
OLD ALTON ROAD
1000'
22
30
46
21
SS-013
SS-012
47
35
34
3A
36
1A
PUMPING WELL B
UNIT 1
UNIT 5
45
37R
UNIT 4
SW-008
SD-008
SS-011
SS-010
SS-009
SW-007
SD-007
33
38
39
WEST WELL
UNIT 4
8-8A
EAST WELL
UNIT 2
25
PUMPING WELL D
23
24
5-5A
32
UNIT 3
4-4A
31-31A
2-2B
7-7A
12
TRUE NORTH
PLANT NORTH
17°

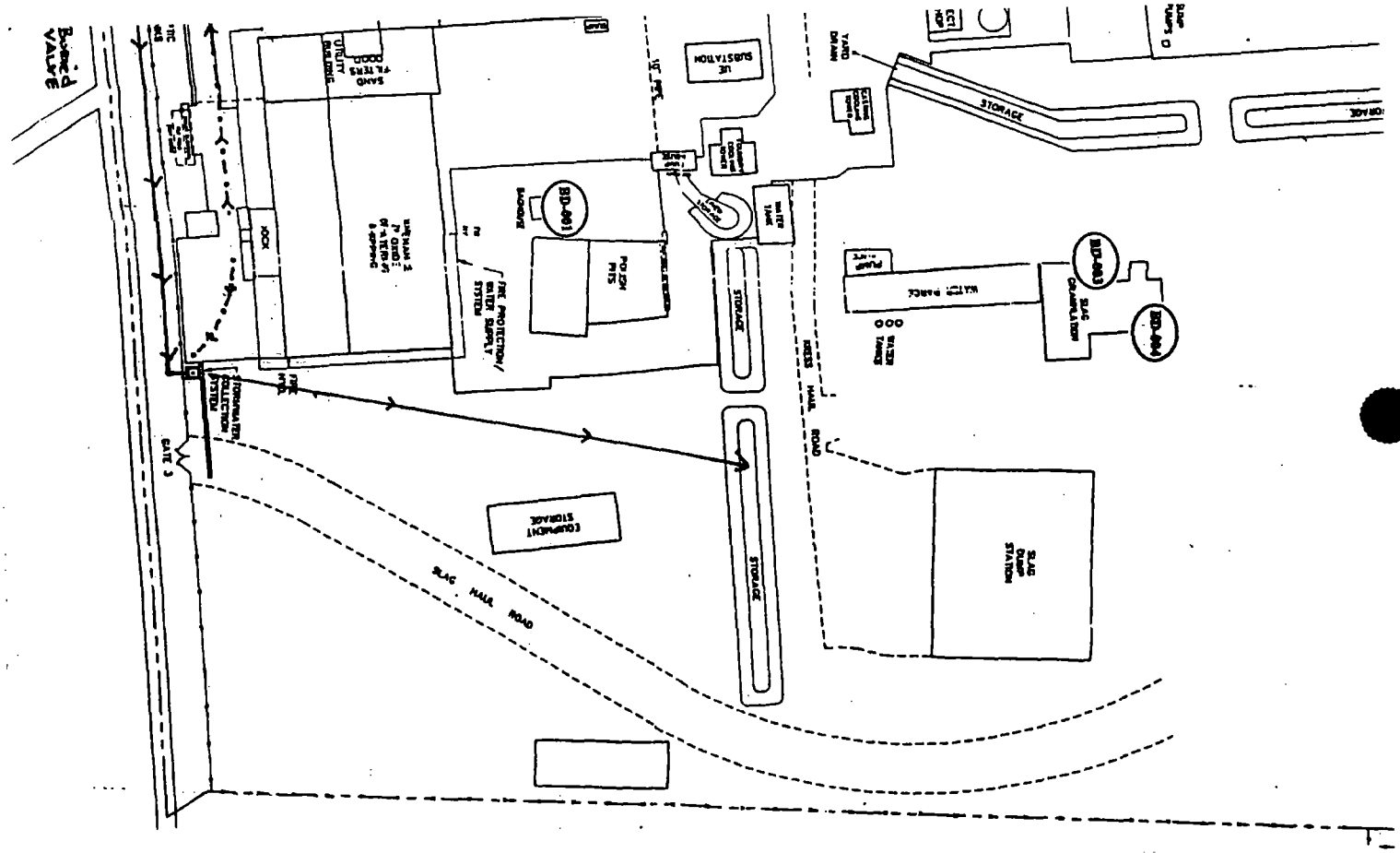


LONG LAKE SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

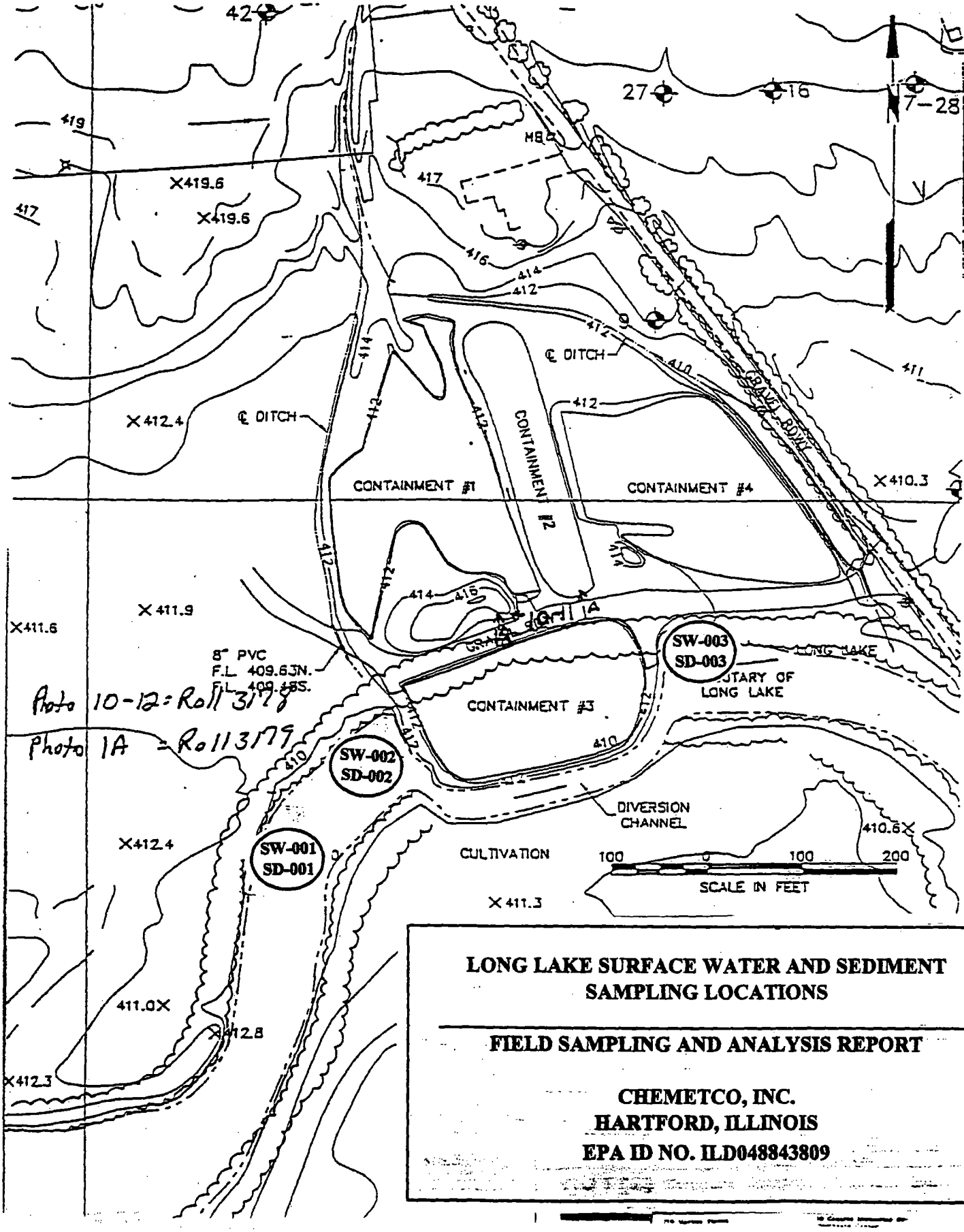

47
35
34
3A
450
440
430
UNIT 1
UNIT 4
UNIT 5
ZO-001
ZO-002
ZO-003
ZO-004
Refractory Brick Pile
RB-001, 002, 003,
004, 005, 006
Slag Hopper
SL-001, 002, 003,
004, 005
SL-013
SL-014
SL-006
SL-010
SL-011
SL-012
SL-019
SL-020
SL-018
SL-017
SL-009
SL-008
SL-016
SL-007
SL-015



BAGHOUSE DUST
SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

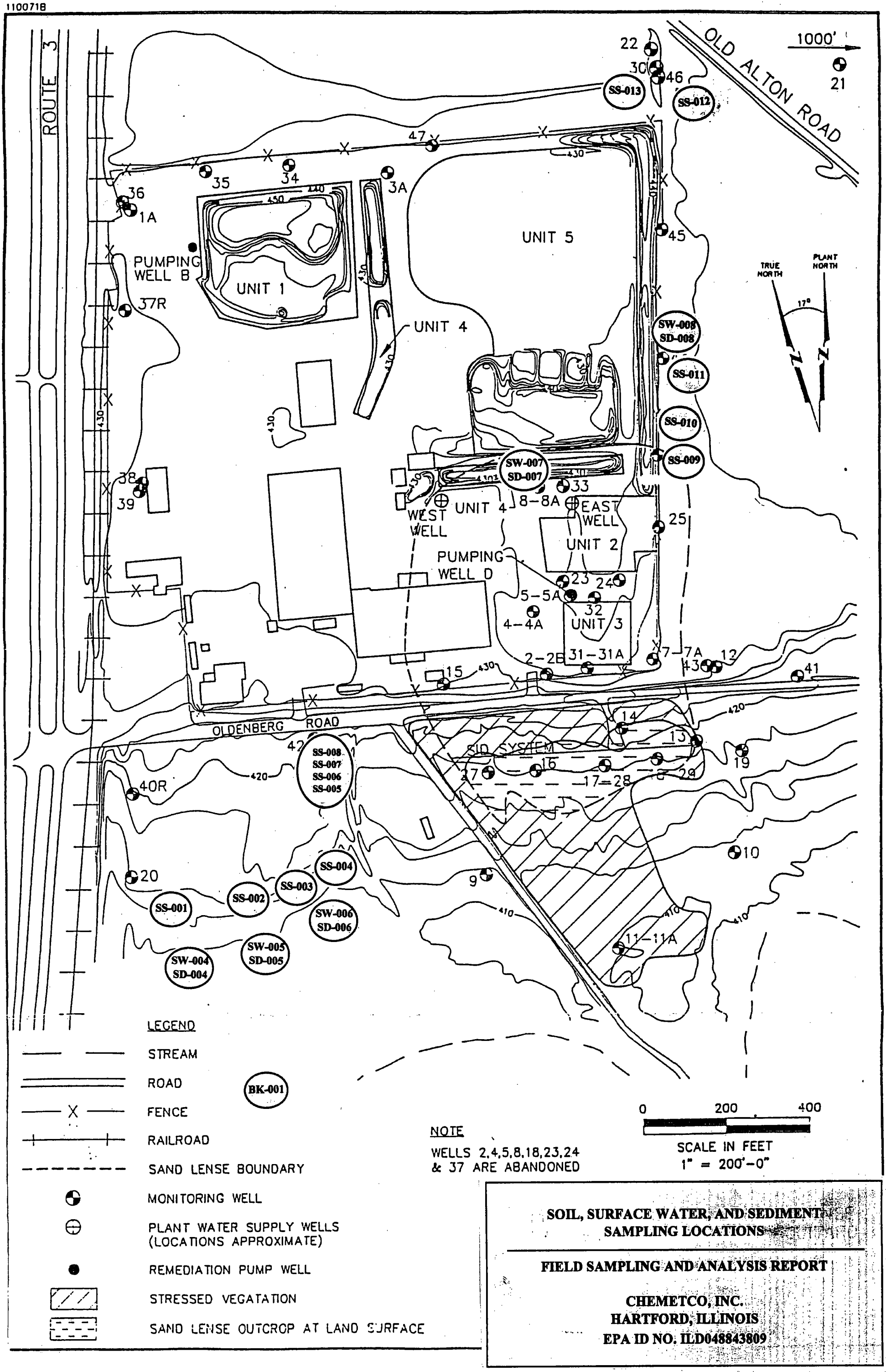


LONG LAKE SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

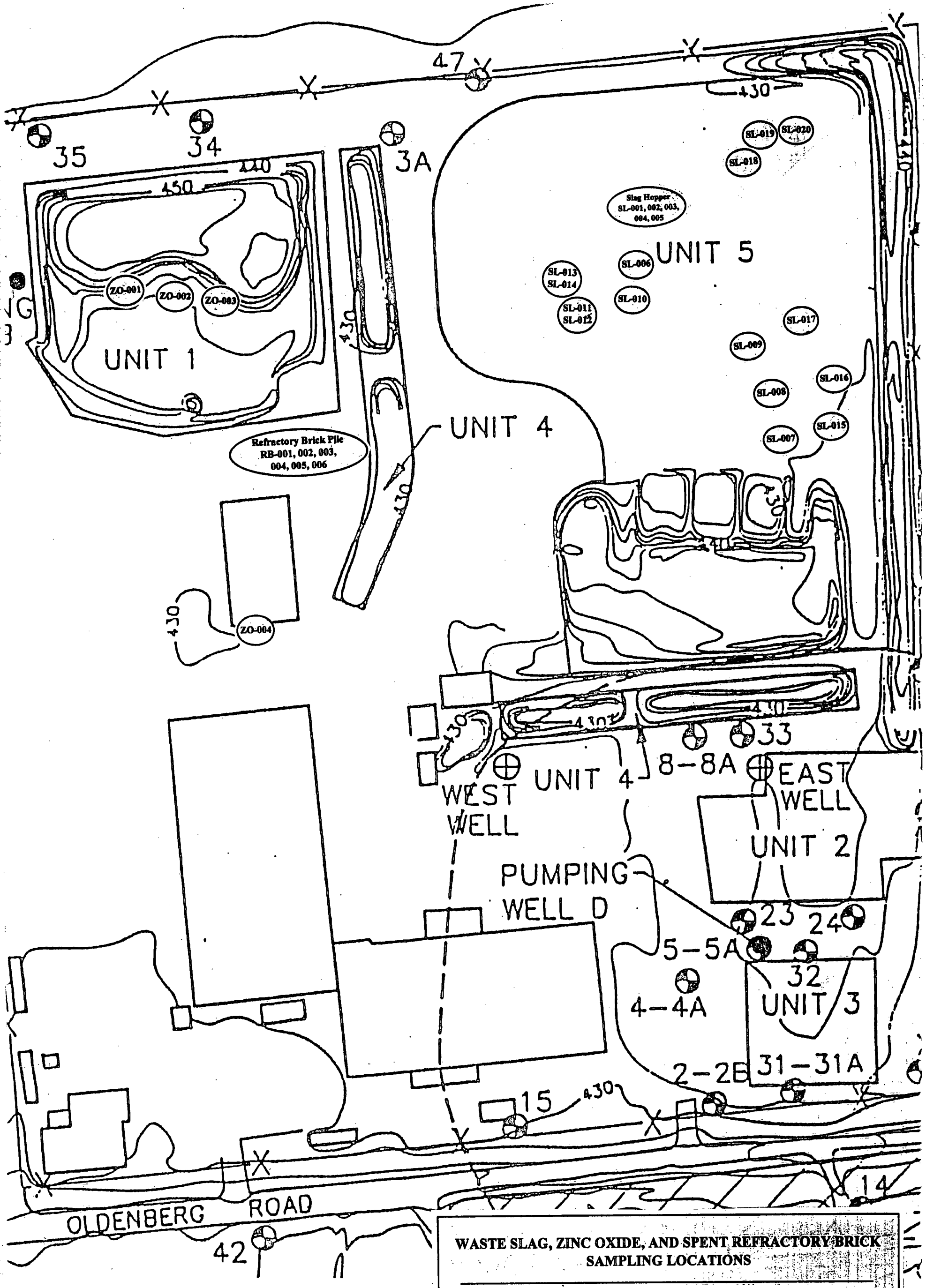
1100718



SOIL, SURFACE WATER, AND SEDIMENT SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

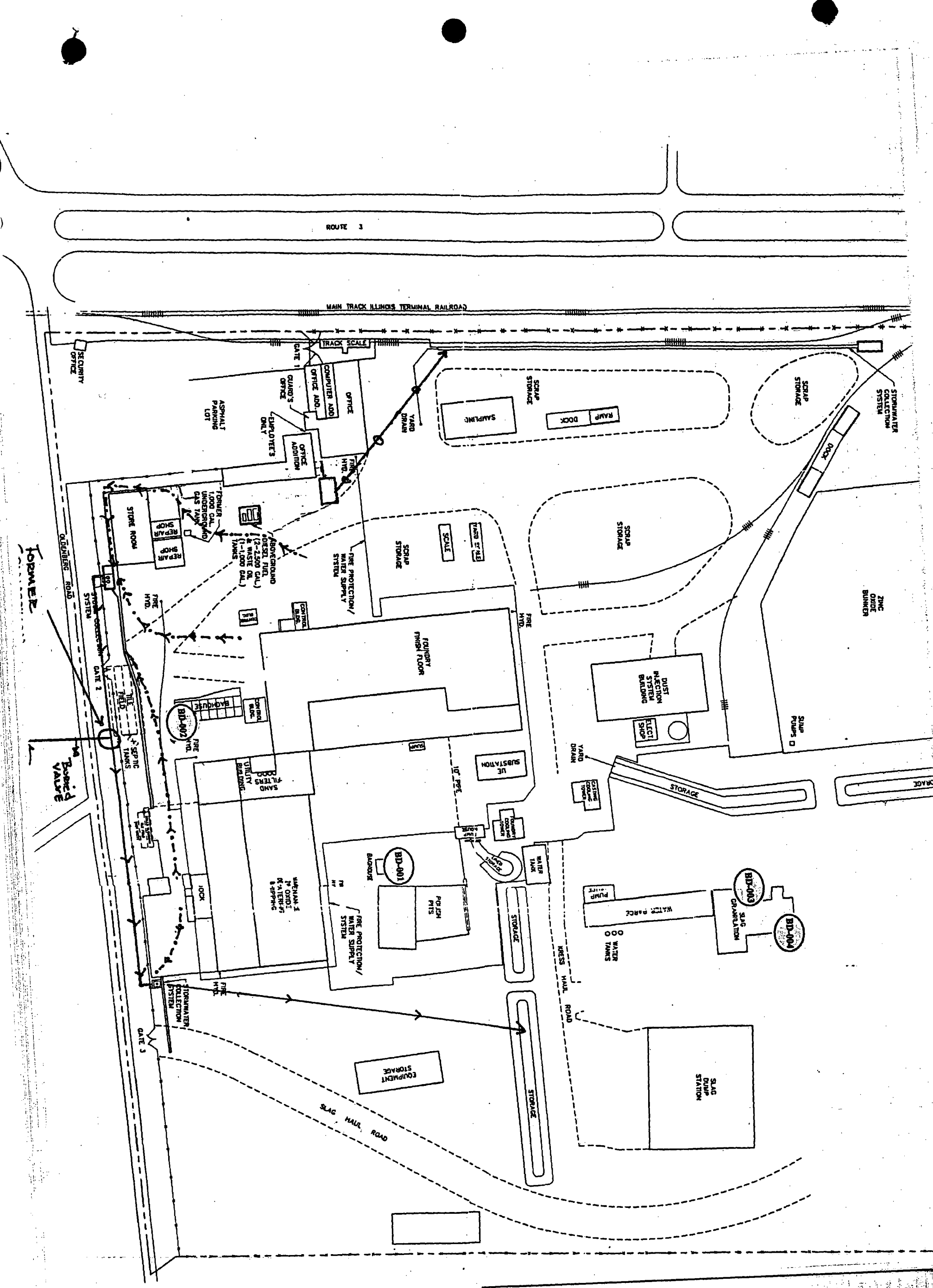
CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809



WASTE SLAG, ZINC OXIDE, AND SPENT REFRACTORY BRICK SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809



BAGHOUSE DUST SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

NOTE:
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IS AGRICULTU
SOUTH IS A
MORE FARML
TOTAL OWNE

APPENDIX B

PHOTOGRAPH LOG

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

Photo No.: 1
Logbook Photo No.: 1-9
Date: May 28, 1998

Time: 1706
Direction: North

Description: View showing area from which slag sample SL-001 was collected. Slag Hopper with conveyors is visible in background.

Photo No.: 2
Logbook Photo No.: 1-10
Date: May 28, 1998

Time: 1720
Direction: North

Description: View showing area from which slag sample SL-002 was collected. Slag Hopper with conveyors is visible in background.

Photo No.: 3
Logbook Photo No.: 1-11
Date: May 28, 1998

Time: 1731
Direction: North

Description: Overview of pit from which slag sample SL-003 was collected. The sample was collected from darker portions of the pile to the right side of the photograph.

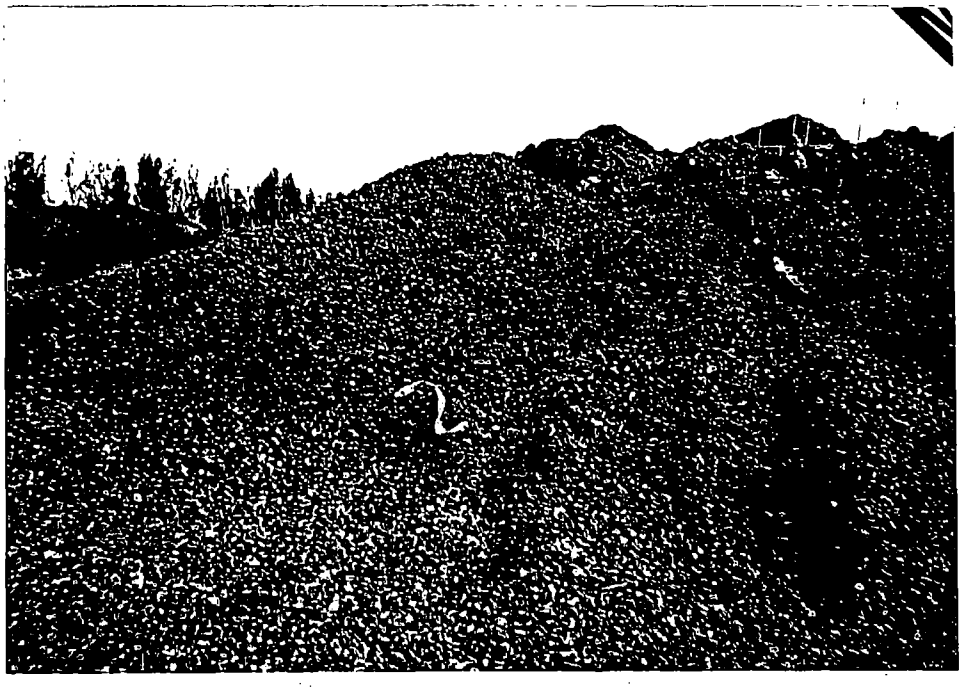


Photo No.: 4
Logbook Photo No.: 1-12
Date: May 28, 1998

Time: 1745
Direction: South

Description: View of slag pile area from which slag sample SL-004 was collected.

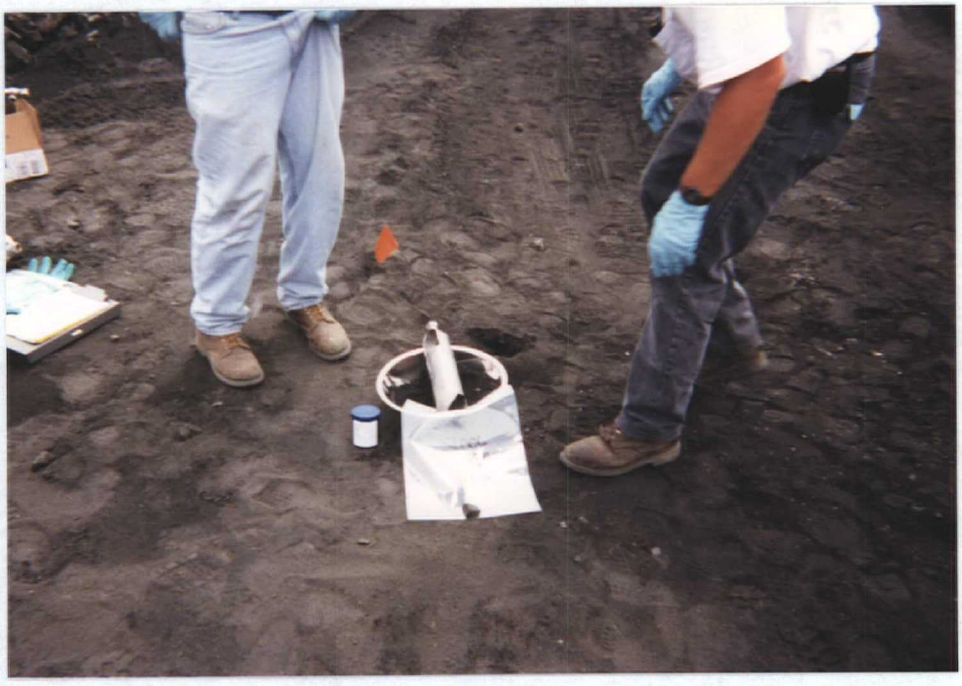


Photo No.: 5
Logbook Photo No.: 2-21
Date: May 29, 1998

Time: 1208
Direction: NA

Description: View of slag sampling location SL-006. Sample was collected from area located approximately one foot to the upper right of stainless-steel bowl.

Photo No.: 6
Logbook Photo No.: 2-16
Date: May 29, 1998

Time: 1046
Direction: NA

Description: View of slag sampling location SL-007.

Photo No.: 7
Logbook Photo No.: 2-18
Date: May 29, 1998

Time: 1106
Direction: West

Description: View of slag sampling location SL-008. Sample was collected in excavated area.

Photo No.: 8
Logbook Photo No.: 1-17
Date: May 29, 1998

Time: 1045
Direction: South

Description: Overview of the area from which slag samples SL-007, SL-008, SL-015, and SL-016 were collected. Facility back hoe was used to excavate areas for sample collection.

Photo No.: 9
Logbook Photo No.: 1-22
Date: May 29, 1998

Time: 1242
Direction: West

Description: View of slag sampling location SL-009 located in excavated area. TechLaw personnel are shown collecting composite sample of slag material from three sides of the excavated area.

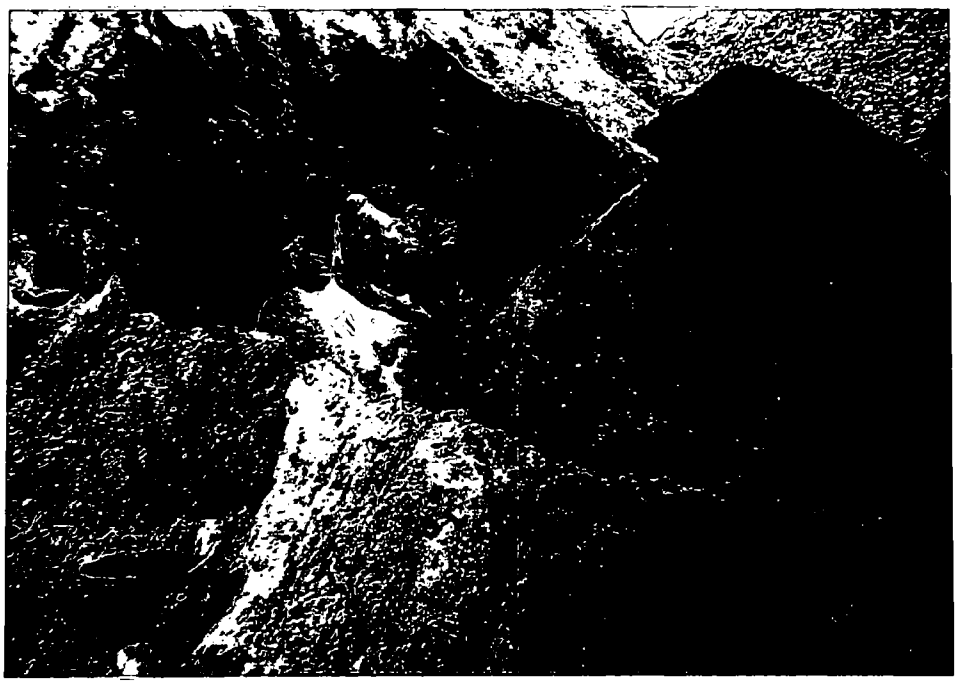


Photo No.: 10
Logbook Photo No.: 1-23
Date: May 29, 1998

Time: 1248
Direction: South

Description: View of slag sampling location SL-010 identified by orange flag.

Photo No.: 11
Logbook Photo No.: 1-21
Date: May 29, 1998

Time: 1230
Direction: West

Description: View of slag sampling location SL-011 identified by orange flag directly right of stainless-steel bowl. TechLaw personnel are preparing to collect sample with stainless-steel auger and stainless steel bowl.

Photo No.: 12
Logbook Photo No.: 2-22
Date: May 29, 1998

Time: 1213
Direction: West

Description: View of slag sampling location SL-013 (upper flag) and SL014 (lower flag).

Photo No.: 13
Logbook Photo No.: 2-17
Date: May 29, 1998

Time: 1057
Direction: NA

Description: View of slag sampling location SL-015 located within excavated area.

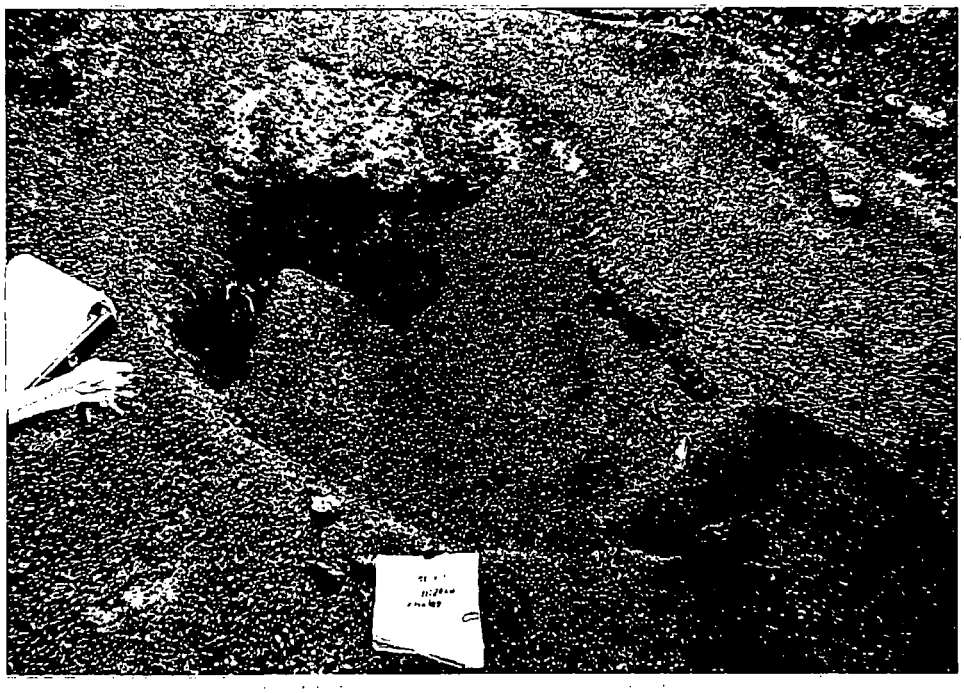


Photo No.: 14
Logbook Photo No.: 2-19
Date: May 29, 1998

Time: 1115
Direction: East

Description: View of slag sampling location SL-016 located within excavated area.

Photo No.: 15
Logbook Photo No.: 1-18
Date: May 29, 1998

Time: 1123
Direction: Northeast

Description: View of excavating equipment at slag sampling location SL-017.

Photo No.: 16
Logbook Photo No.: 1-19
Date: May 29, 1998

Time: 1142
Direction: Northwest

Description: View of excavation equipment at slag sampling location SL-018.

Photo No.: 17
Logbook Photo No.: 2-20
Date: May 29, 1998

Time: 1153
Direction: West

Description: View of slag sampling locations SL-018, SL-019, and SL-020. SL-018 is visible as far-left excavation; SL-019 is visible as center excavation; and SL-020 is visible as far-right excavation. Sampling locations are identified with orange flags.

Photo No.: 18
Logbook Photo No.: 1-20
Date: May 29, 1998

Time: 1142
Direction: Northwest

Description: Overview of area from which slag samples SL-019 and SL-020 were collected. The orange flag in the foreground marks the location from which SL-020 was collected while the flag (barely visible) in the background marks the sampling location for SL-019.

Photo No.: 19
Logbook Photo No.: 2-23
Date: May 29, 1998

Time: 1217
Direction: South

Description: View of excavated area of slag pile. Pile has notable variability in strata and slag sizes with some variation in slag color and texture.

Photo No.: 20
Logbook Photo No.: 2-10
Date: May 29, 1998

Time: 0833
Direction: South

Description: Overview of Zinc Oxide Bunker.

Photo No.: 21
Logbook Photo No.: 2-11
Date: May 29, 1998

Time: 0833
Direction: Southeast

Description: Overview of Zinc Oxide Bunker.

Photo No.: 22
Logbook Photo No.: 2-12
Date: May 29, 1998

Time: 0833
Direction: West

Description: Overview of Zinc Oxide Bunker.

Time: 0855
Direction: South

Photo No.: 23
Logbook Photo No.: 2-15
Date: May 29, 1998

Description: View of zinc oxide sampling location ZO-001 in the Zinc Oxide Bunker.

Photo No.: 24
Logbook Photo No.: 2-14
Date: May 29, 1998

Time: 0855
Direction: South

Description: View of zinc oxide sampling location ZO-002 in the Zinc Oxide Bunker.

Photo No.: 25
Logbook Photo No.: 2-13
Date: May 29, 1998

Time: 0855
Direction: South

Description: View of zinc oxide sampling location ZO-003 in the Zinc Oxide Storage.

Photo No.: 26
Logbook Photo No.: 3-4
Date: May 29, 1998

Time: 0953
Direction: Northeast

Description: View of front-end loader carrying fresh zinc oxide waste from the filter press from which zinc oxide sample ZO-004 was collected.

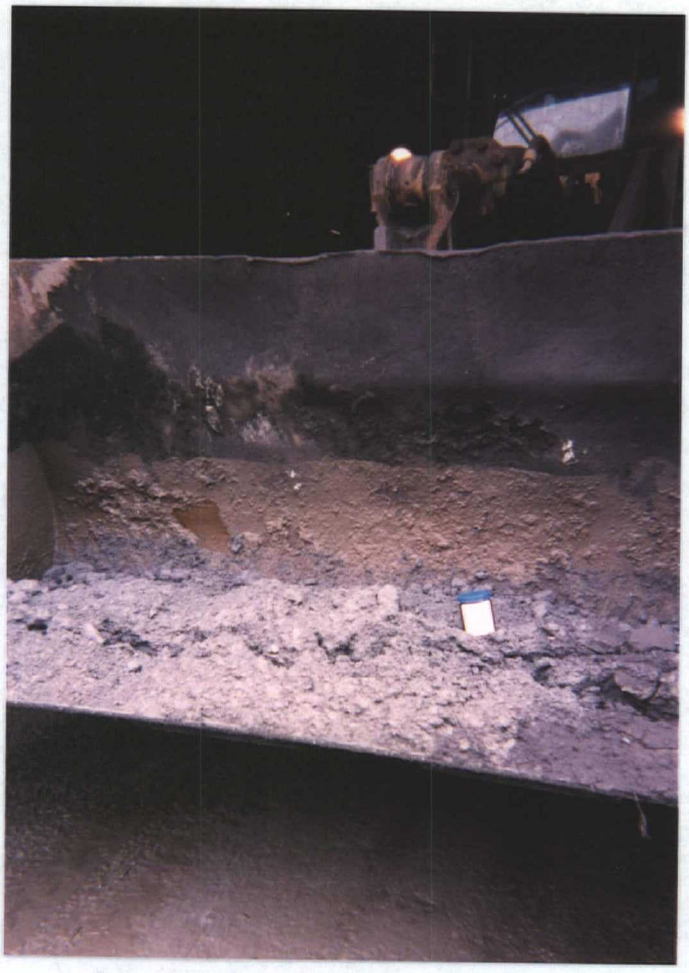


Photo No.: 27
Logbook Photo No.: 3-5
Date: May 29, 1998

Time: 0955
Direction: North

Description: View of zinc oxide sampling location ZO-004 in the bucket of the front-end loader. Sample container visible in bucket.

Photo No.: 28
Logbook Photo No.: 3-9
Date: May 29, 1998

Time: 1025
Direction: Southeast

Description: View of No. 1 Baghouse dust collection receptacle from which baghouse dust sample BD-001 was collected.

Photo No.: 29
Logbook Photo No.: 3-6
Date: May 29, 1998

Time: 1015
Direction: Northwest

Description: View of No. 2 Baghouse, also known as the Roof Baghouse, from which baghouse dust sample BD-002 was collected.

Photo No.: 30
Logbook Photo No.: 3-7
Date: May 29, 1998

Time: 1015
Direction: North

Description: View of No. 2 Baghouse, also known as the Roof Baghouse, from which baghouse dust sample BD-002 was collected.

Photo No.: 31
Logbook Photo No.: 3-8
Date: May 29, 1998

Time: 1015
Direction: Northwest

Description: View of No. 2 Baghouse, also known as the Roof Baghouse, from which baghouse dust sample BD-002 was collected. Sample was collected from baghouse "apartment" visible on far-left portion of photograph.

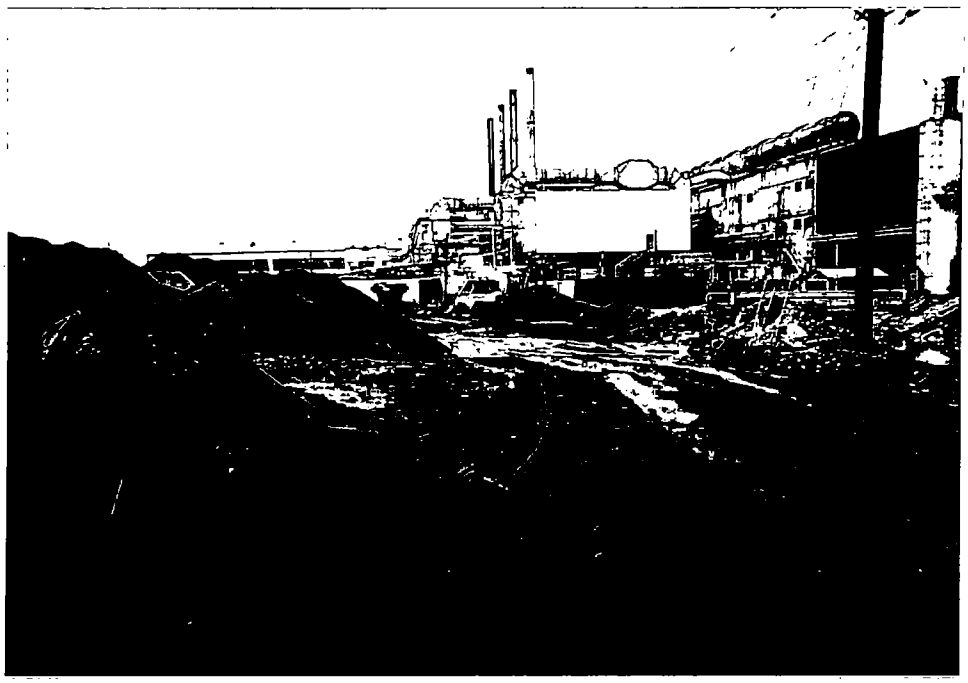


Photo No.: 32
Logbook Photo No.: 3-10
Date: May 29, 1998

Time: 1030
Direction: South

Description: View to the west of the Slag Granulation Plant.

Photo No.: 33
Logbook Photo No.: 3-11
Date: May 29, 1998

Time: 1045
Direction: Northeast

Description: View of Primary Baghouse for the Slag Granulation Plant from which baghouse dust sample BD-003 was collected. Sample collected from baghouse dust collection receptacle visible as green dumpster in photograph.

Photo No.: 34
Logbook Photo No.: 3-12
Date: May 29, 1998

Time: 1045
Direction: Northwest

Description: View of baghouse dust collection receptacle from which baghouse dust sample BD-003 was collected.

Photo No.: 35
Logbook Photo No.: 3-13
Date: May 29, 1998

Time: 1100
Direction: Southwest

Description: View of sample collection port from the Secondary Baghouse for the Slag Granulation Plant from which baghouse dust sample BD-004 was collected.

Photo No.: 36
Logbook Photo No.: 1-24
Date: May 29, 1998

Time: 1430
Direction: Northeast

Description: View of bagged refractory brick sample RB-001. Sample was collected from brick sample obtained from pile located on the left portion of the photograph.

Photo No.: 37
Logbook Photo No.: 1-25
Date: May 29, 1998

Time: 1440
Direction: West

Description: View of refractory brick sample RB-002 visible as pieces of brick visible in center of photograph. Refractory brick pile visible in background.

Photo No.: 38
Logbook Photo No.: 2-24
Date: May 29, 1998

Time: 1440
Direction: NA

Description: View of refractory brick sample RB-003 visible as pieces of brick in center of photograph.

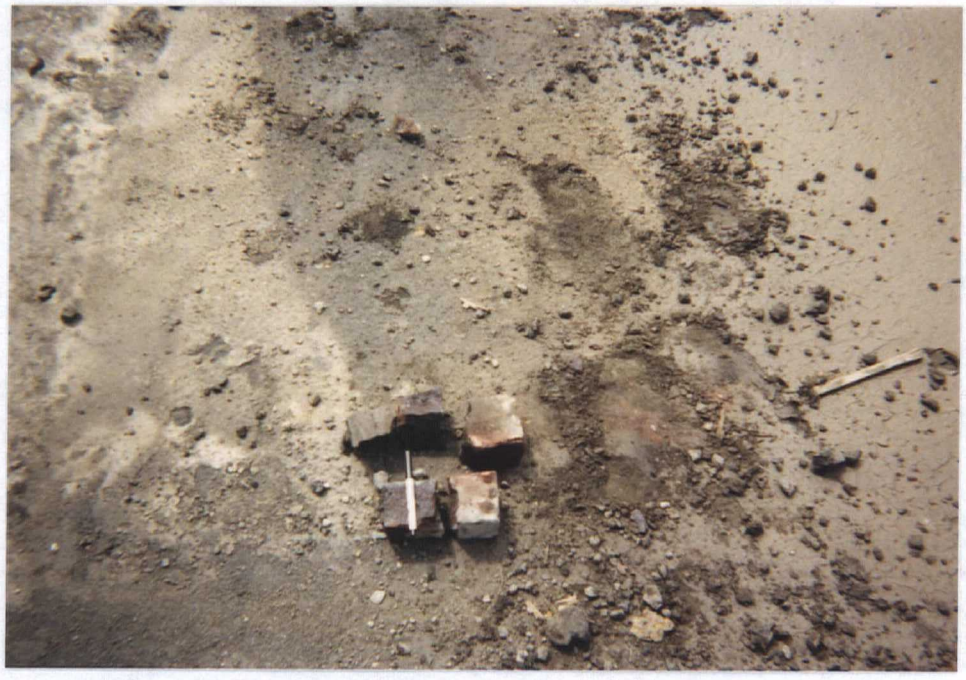


Photo No.: 39
Logbook Photo No.: 1-26
Date: May 29, 1998

Time: 1450
Direction: West

Description: View of refractory brick sample RB-004 visible as pieces of brick in lower-center portion of photograph. Chisel used to break the brick is visible resting on the brick sample.

Photo No.: 40
Logbook Photo No.: 1-27
Date: May 29, 1998

Time: 1453
Direction: West

Description: View of refractory brick sample RB-005 visible as pieces of brick in center of photograph. Hammer used with chisel to break brick is visible in photograph.

Photo No.: 41
Logbook Photo No.: 2-1
Date: May 28, 1998

Time: 1002
Direction: Southwest

Description: View of soil sampling location SS-001 identified with orange flag in center of photograph.

Photo No.: 42
Logbook Photo No.: 2-2
Date: May 28, 1998

Time: 1034
Direction: Southwest

Description: View of soil sampling location SS-002 identified with orange flag in center of photograph.

Photo No.: 43
Logbook Photo No.: 2-3
Date: May 28, 1998

Time: 1044
Direction: Southwest

Description: View of soil sampling location SS-003 identified with orange flag in center of photograph.

Photo No.: 44
Logbook Photo No.: 2-4
Date: May 28, 1998

Time: 1110
Direction: Southwest

Description: View of soil sampling location SS-004 identified with orange flag in center of photograph.

Photo No.: 45
Logbook Photo No.: 2-5
Date: May 28, 1998

Time: 1125
Direction: West

Description: View of soil sampling location SS-005 identified with orange flag in bottom-right portion of photograph.

Photo No.: 46
Logbook Photo No.: 2-6
Date: May 28, 1998

Time: 1134
Direction: South

Description: View of soil sampling location SS-006 identified with orange flag in center of photograph.

Photo No.: 47
Logbook Photo No.: 2-7
Date: May 28, 1998

Time: 1145
Direction: East

Description: View of soil sampling location SS-007 identified with orange flag in right-center portion of photograph.

Photo No.: 48
Logbook Photo No.: 2-8
Date: May 28, 1998

Time: 1156
Direction: North

Description: View of soil sampling location SS-008 visible as disturbed soil area located approximately one foot to the right of tan storage tote.

Photo No.: 49
Logbook Photo No.: 1-13
Date: May 28, 1998

Time: 1825
Direction: West

Description: View of soil sampling location SS-009 identified with orange flag in center of photograph.

Photo No.: 50
Logbook Photo No.: 1-14
Date: May 28, 1998

Time: 1827
Direction: North

Description: View of soil sampling location SS-010 identified with orange flag to the right of the surface water in the lower-left portion of the photograph.

Photo No.: 51
Logbook Photo No.: 1-15
Date: May 28, 1998

Time: 1840
Direction: West

Description: View of soil sampling location SS-011.

Photo No.: 52
Logbook Photo No.: 2-9
Date: May 28, 1998

Time: 1855
Direction: Southwest

Description: View of soil sampling location SS-012 located northeast of the facility. Sample collected from disturbed soil area visible in center of photograph. Chemetco facility fence is visible in background.

Photo No.: 53
Logbook Photo No.: 1-1
Date: May 28, 1998

Time: 1016
Direction: Southeast

Description: View of area within Long Lake from which surface water sample SW-001 and co-located sediment sample SD-001 were collected.

Photo No.: 54
Logbook Photo No.: 1-2
Date: May 28, 1998

Time: 1107
Direction: Southeast

Description: View of area within Long Lake from which surface water sample SW-002 and co-located sediment sample SD-002 were collected.

Photo No.: 55
Logbook Photo No.: 1-4
Date: May 28, 1998

Time: 1210
Direction: South

Description: View of area within Long Lake from which surface water sample SW-003 and co-located sediment sample SD-003 were collected.

Photo No.: 56
Logbook Photo No.: 1-5
Date: May 28, 1998

Time: 1357
Direction: Northeast

Description: View showing area from which the surface water sample SW-004 and co-located sediment sample SD-004 were collected in the wetland area to the south of the facility.

Photo No.: 57
Logbook Photo No.: 1-6
Date: May 28, 1998

Time: 1440
Direction: West

Description: View showing area from which the surface water sample SW-005 and co-located sediment sample SD-005 were collected in the wetland area to the south of the facility. Samples were collected from area identified with orange flag in the left-center portion of the photograph.

Photo No.: 58
Logbook Photo No.: 1-7
Date: May 28, 1998

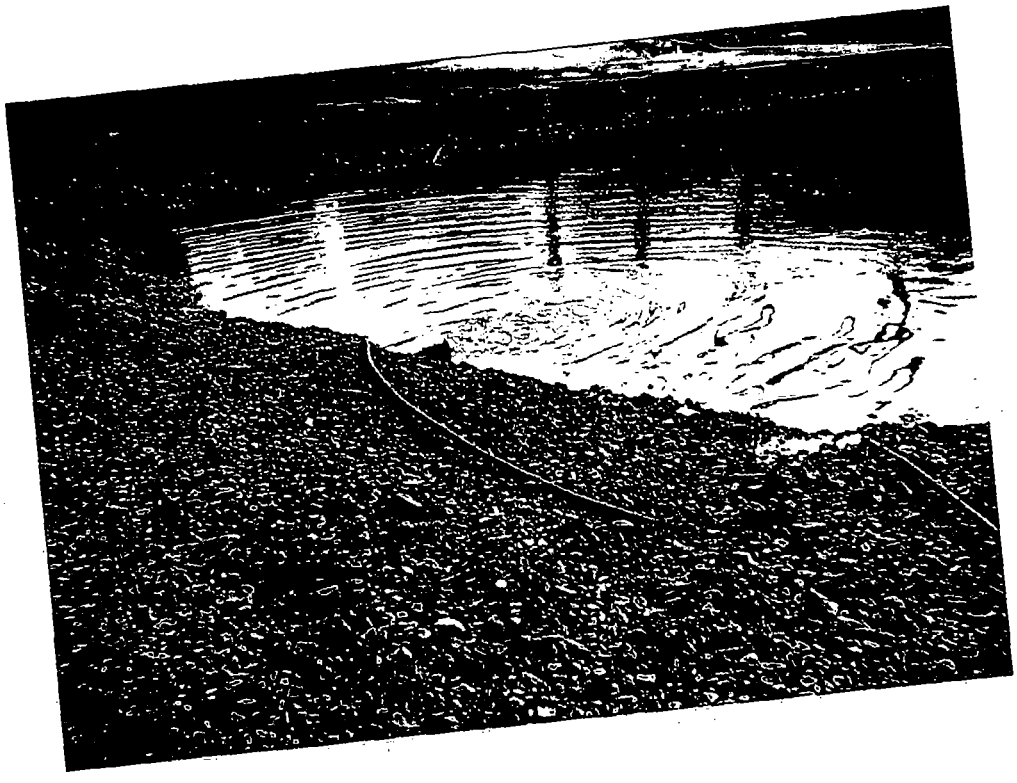
Time: 1523
Direction: East

Description: View showing area from which the surface water sample SW-006 and co-located sediment sample SD-006 were collected in the wetland area to the south of the facility.

Photo No.: 59
Logbook Photo No.: 3-1
Date: May 28, 1998

Time: 1710
Direction: East

Description: View showing facility's stormwater and non-contact cooling water pond from which surface water sample SW-007 and co-located sediment sample SD-007 were collected.



Time: 1711
Direction: Southwest

Photo No.: 60
Logbook Photo No.: 3-2
Date: May 28, 1998

Description: View showing facility's stormwater and non-contact cooling water pond located directly west of sample locations SW-007 and SD-007.

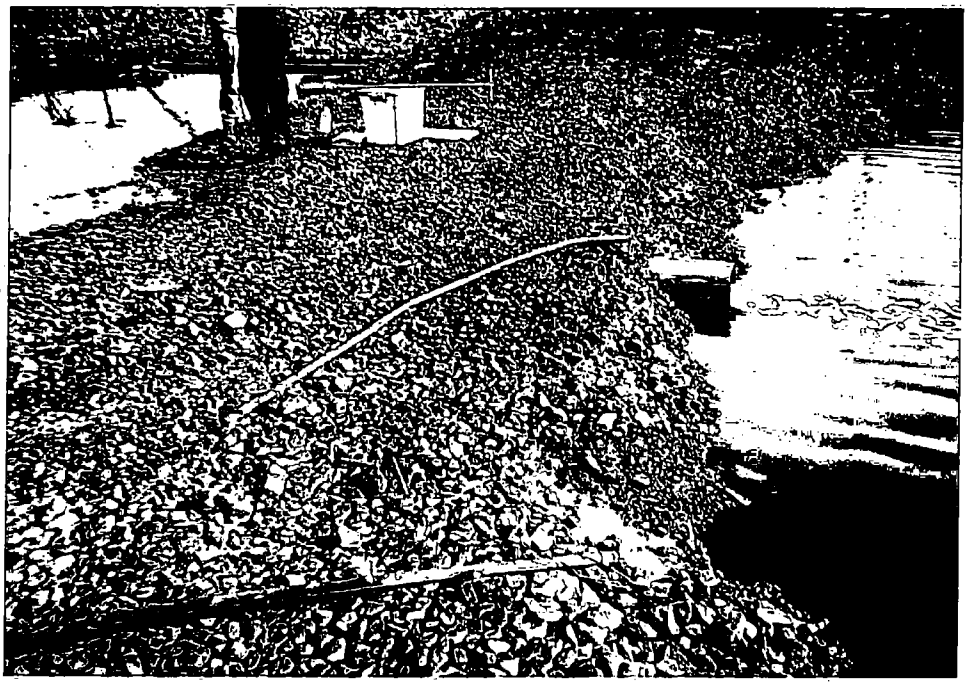


Photo No.: 61
Logbook Photo No.: 3-3
Date: May 28, 1998

Time: 1711
Direction: Southeast

Description: View showing facility's stormwater and non-contact cooling water pond (left) from which samples SW-007 and SD-007 were collected.

Photo No.: 62
Logbook Photo No.: 1-16
Date: May 28, 1998

Time: 1850
Direction: West

Description: View showing area from which the surface water sample SW-008 and co-located sediment sample SD-008 were collected in a slag pile runoff area to the east of the facility. Samples were collected in area identified with orange flag in center of photograph. Slag is visible pressing against the facility's fence in the background. Visible surface water flow from the slag pile is seen in the background. Horiba Water Quality Checker is visible in foreground.

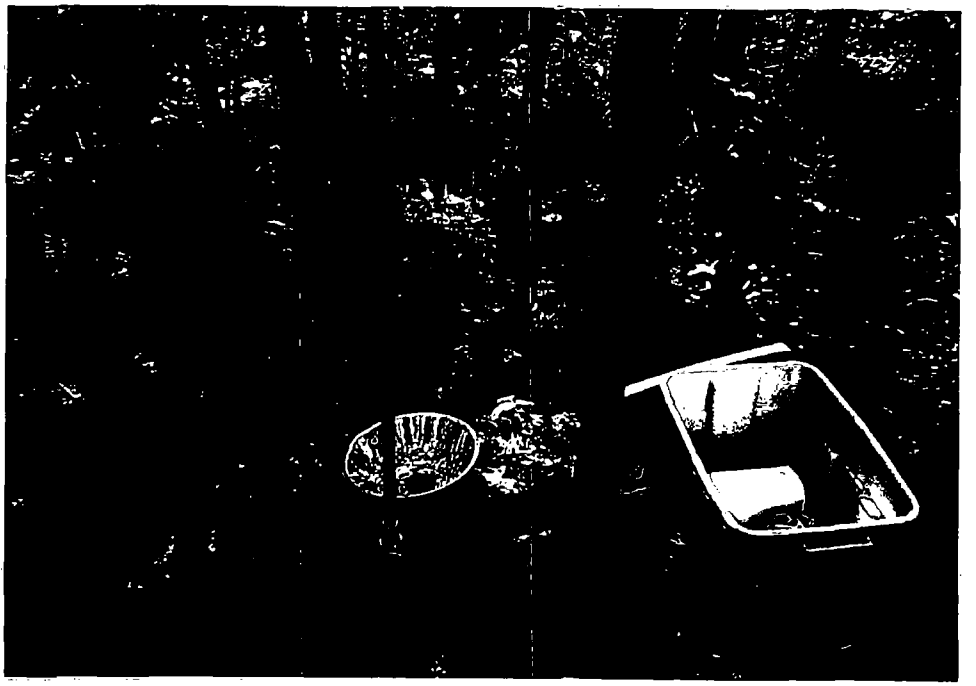


Photo No.: 63
Logbook Photo No.: 1-3
Date: May 28, 1998

Time: 1135
Direction: Southeast

Description: View of area from which background soil sample BK-001 was collected in the wetland area south of the facility.

Photo No.: 64
Logbook Photo No.: 2-25
Date: May 29, 1998

Time: 1610
Direction: South

Description: View of area from which background soil sample BK-002 was collected in the yard of residence located to the south of the facility.

Photo No.: 65
Logbook Photo No.: 2-26
Date: May 29, 1998

Time: 1620
Direction: South

Description: View of area from which background soil sample BK-003 was collected in the yard of residence located to the south of the facility.

Photo No.: 66
Logbook Photo No.: 1-8
Date: May 28, 1998

Time: 1610
Direction: East

Description: View of collection of equipment blank sample SD-306 from decontaminated, stainless-steel, hand auger head. Deionized water is being poured over the auger head and collected in a 1-liter, plastic container for RCRA total metals analyses.

APPENDIX C

FIELD LOGS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

IF FOUND PLEASE RETURN TO:

NAME

COMPANY

FORESTRY SUPPLIERS 49365

STREET

CITY STATE ZIP

PHONE

JOB BOOK

FROM PENINSULAR PUBLISHING

PROJECT NAME Chemstar, Alton IL

PROJECT NUMBER

CREW Anthony, Mike, Ted, Lou

DATE 05/28/99 BOOK # 1 OF

WEATHER Sunny, 69° F at 6:00 pm

FIELD BOOK
16 PAGE
8 LEAVES
50% RAG

Logbook No. 1

CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin. } \frac{1}{2} D}$

$\text{Sin. } \frac{1}{2} D = \frac{50}{R}$

$\text{Sin. } \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin. } \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$; $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574\,d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3}d^2$. The combined correction is negative.

PROBABLE ERROR. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean = $\pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	1/8	3-16	1/4	5-16	3/8	7/16	1/2	9/16	5/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Chemtech (1)

0710: Arrive at facility with
John Hoehner (Tech Law)
Kevin Hall (Tech Law)
P. Kneffler (U.S. EPA)
Doug Updike (Tech Law)
Anthony Musick (Tech Law)

0727: Check in at the facility reception/security area, where we were received by Ms. Heather Young (Chemtech).
* Also in attendance was Ms. Cindy S. Davis (CSD Envir. Svcs.)

0735: Opening mtg. led by Heather Young/P. Kneffler to discuss the Sampling Plan/Agenda

0745: End of opening mtg.

Ans, 05/28/98

(1)

0817: Got to the designated decontamination Station/area.

* Off-loaded drums to be used for storing IDW.

0830: Begin determining sampling locations.

0930: Prepare to begin actual sampling. Break up into 2 teams.

Kevin Higgins & Anthony Mubiru } one team taking background, surface water & sediment samples.

Doug Updike & John Koehnen } other team taking mostly soil samples.

1011: Begin sample collection.

AM, 05/26/96

(2)

Photo / Camera #1 Time:

Photo #	Time Taken	Direction
SW-1/SD-1 Photo #1	1016	South ~~East~~
SW-2/SD-2 Photo #2	1107	S-~~East~~
BK-1 Photo #3	1135	S-East
SW-3/SD-3 Photo #4	1210	South
SW-4/SD-4 Photo #5	1357	NW-~~East~~
SW-5/SD-5 #6	1440	West
SW-6/SD-6 #7	1523	East
SD-306 #8	1600	East

AM, 05/28/96

Field Measurement (4)

Sample # / Sample location	Time Collected
SW-1	1015 hours pH = 6.89 Cond. = 0.468 mS cm⁻¹ Turbidity = 50 NTU D.O = 3.6 mg/L Temp = 24.2 °C
SW-1 (MS/MSD)	1020
SW-1 (MS/MSD) SW-1 (MS/MSD) SW-1 (Metals)	
SD-001	
SD-001 (MS/MSD)	1032
SD-001 (MS/MSD) SD-001 (MS/MSD)	

AM, 05/28/98

Field Measurement (5)

Sample # / Sample Location	Times Collected
SW-2	1100 pH = 7.33 Cond = 0.485 mScm⁻¹ Turbidity = 70 NTU D.O = 7.00 mg/L Temp = 24.9 °C
SW-2 (Metals)	1115
SW-2 (Metals) AM, 05/28/98	
SD-2 (Metals)	1120
SW-3	1210
	pH = 8.06 Cond = 0.612 mS cm⁻¹ Turbidity = 40 NTU D.O = 11.3 mg/L Temp = 28.5 °C
AM 05/28/98	
SW-3 (MS/MSD) SW-3 (Metals) SD-3 (Metals)	1220

AM, 05/28/98

1340 hours

Returned from lunch break

(6)

Sample #s	Field Measurements & Times Collected
SW-4	1400 hours
AM, 05/28/98	pH = 8.22 8.23
	Cond = 9.4 mS cm^{-1}
	Turbidity = 337 NTU
	D.O = 11.5 mg/L
	Temp = 26.5 °C
	Cond = 2.06 mS cm^{-1}
SD-4	1410
SW-5	pH = 8.19
	Cond = 2.59 mS cm^{-1}
	Turbidity = 24 NTU
AM, 05/28/98	D.O = 15.0 mg/L
	Temp = 28.5 °C
SW-5	1445
SD-5	1500

AM, 05/28/98

(7)

Sample #s	Field Measurements & Times Collected
SW-6	Collected at 1530
	pH = 8.09
	Cond = 2.06 mS cm^{-1}
	Turbidity = 45 NTU
	D.O = 1.5 mg/L
	Temp = 24.9 °C
SD-6	Collected at 1545
1650:	Got to area where the Stag samples were Collected.
SL-001	1707
SL-002	1720
SS-10	1830
SS-12	Collected at
AM, 06/28/98	pH = 11.17
SW-8	Cond = 20.8 mS cm^{-1}
	Turbidity = 181 NTU
	D.O = 12 mg/L
	Temp = 19.3 °C

Photo #	Direction	Time taken
Photo #9 SL-001	North	1706
SL-002 Photo #10	N	1720
SL-003 Photo #11	N	1731
SL-004 Photo #12	S	1745
SS-9 Photo #13	W	1826
SS-10 Photo #14	N	1827
SS-11 Photo #15	W	1840
SW-8/SED-8 Photo #16	W	1850

AM, 05/28/98

1940: leave the site for the day

AM, 05/28/98

0920: Arrive at plant. Sign in.

Photo #	Time taken	Direction
17 Overview photo	1045	S
Photo #17 was taken in the area from which slag samples SL-007 & SL-015 & SL-008, SL-006 were collected. AM, 06/29/98		
Photo # 18 shown collecting sample SL-017	1123	NEast
Photo # 19 SL-018	1142	N. West
Photo # 20 Flag in background → location for SL-019 Flag in foreground → " " SL-020. Flags are orange in colour	1142	N. West
Photo # 21 SL-011	1230	West
Photo # 22 SL-009	1242	South
Photo # 23 SL-010	1248	South

Sample #	Time Collected
SL-007	1046 (by JK)
SL-015	1057
SL-008	1106
SL-016	1115
SL-017	1123
SL-018	
SL-019	
SL-020	1150
SL-006	1208
SL-013	1214
SL-014	1213
SL-012	1225
SL-009	1242
SL-010	1248

Completed collecting slag samples at 1255. Prepared to leave slag collection area immediately thereafter. → Time of leaving slag collection area ≈ 1307

Break for lunch at ≈ 1310

AM, 06/29/98

(12)

Photo #	Time taken	Direction
Photo #24 RB-001	1430	NEast
Photo #25 RB-002	1440	West
Photo #26 RB-004	1450	West
Photo #27 RB-005	1453	N. West

(13)

Sample #	Time Collected
1350: Return from lunch break.	
1410: Break up into 2 teams, viz: Doug Lepolke + Decontaminating Used Equipment	
Pat. K (EPA) John Kochevar Kevin Higgins Chris (EPA) Anthony M } Collection of Brick Samples	
RB-001	1430
RB-007	1435
RB-003	1440
RB-004	1445
RB-005	1450
RB-006	1505
1508: Completed (departed) brick sample collection.	

AM 10/29/98

Sample #	Time Collected
BK-002	1610
BK-003	1625

1645: left site for the day.

CSD Environmental Services, Inc.

2220 Yale Blvd.
Springfield, Illinois 62703
217/522-4085
FAX 217/522-4087

Cindy S. Davis
President

CSD Environmental Services, Inc.

2220 Yale Blvd.
Springfield, Illinois 62703
217/522-4085
FAX 217/522-4087

Cindy S. Davis
President

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LINE RULE

Spiral Notebook

CHEMETCO

JOHN KOEHNEN - TECHLAW

No. 393N
32 Sheets
4 5/8" x 7"
Numbered Pages

Logbook No. 2

"Rite in the Rain"®
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TECHLAW, INC.
Address 20 N. WACKER DR. #1260
CHICAGO, IL 60606
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Project CHEMETCO - SAMPLE COLLECTION ACTIVITIES.

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TACOMA, WA 98424-1017 USA

CONTENTS

PAGE	REFERENCE	DATE

5/28/98 PK

0710 ARRIVE AT CHEMETCO SITE AND PROCEED TO MAIN OFFICE. MEET WITH HEATHER YOUNG

PERSONNEL:
P. KUEFLER - U.S. EPA
K. HIGGINS - TECHLAW
D. VODIKE - TL
A. MUBIRU - TL
J. KOEHNEN - TL

WEATHER: WARM ~ 75° F W/ MOD HUMIDITY & PATCHY CLOUDS.

0727 MEET WITH HEATHER YOUNG & CINDY DAVIS (CSO - CHEMETCO ENV CONSULTANT).

- INITIATE KICKOFF MTG.
- PK/KH DISCUSS SCOPE OF ACTIVITIES & REG REQ

5/28/98 JK

0730 PK INIT DISCUSSION OF SUGGESTED ACTIVITIES.

CHEMETCO SPLITS! SW/SED BRICK, SLAG.
- NOT ZINC OXIDE, BH DUST.
- CSD IS FACILITY CONSULTANT & COMPANY OWNER. HEATHER YOUNG EMPLOYEE OF CSD.

0850 MTG WRAP UP. PROCEED TO FIELD AREA, (TOE & RET PONDS) AND SCOPE OUT SAMPLING AREAS. KH & AM WILL SAMPLE SEDS & SW & COLLECT BKG SOIL. JK & DO WILL SAMP SOILS & BRICK AREA.

JK 5/28/98

0958 ARRIVE AT SS01 SAMPLING LOC PREP TO INIT SAMPLING. WILL COLL MS/MSD & DUP

1002 INIT SAMPLING AT LOC: SS01

JK USING CAMERA #2

Camera 2 KRH

PHOTO JK2-1 FACING WSW AT SAMP INIT PT

LOC. SOIL MATRIX IS SLAG/SOIL MIX, DARK BROWN/GREY. LOOSE CONSOL

1016 SAMP COMPLETE. CHEMETCO SPLITS W/ DUP.

5/28/98 GJK

1025 INIT SAMPLING AT SS002. SAMPLE MAT IS DARK BROWN/BLK W/ GRAVEL & SLAG INTER-MIXED. CHEMETCO SPLITS SAMPLE

1034 PHOTO JK2-2 FACING SW AT COMP-SAMPLE LOC 002. LOC IS APPROX 20' OFF GRAVEL ROAD TO SOUTH & 20' OFF OF TOE OF SLAG/SOIL AREA. TO WEST

GJK 5/28/98

1037 INIT SAMPLING AT SS003. MAT IS MOSTLY DRY SAND & GRAVEL MED TO DARK BROWN - CHEMETCO SPLITS

1044 COMPLETE AT SS003

PHOTO JK2-3 FACING SW AT SAMP LOC W/IN SMALL GROUP OF SHRUBS loc ≈ 20' OF GRAVEL RD

1102 INIT SAMP AT SS004. MAT IS MED BRN SLAG/SOIL MIX CHEMETCO SPLITS

5/28/98 JK

1110 PHOTO JK2-4 OF SS004 SAMP LOCATION AT "TOE" OF DRIVEWAY - COMPLETE, MOVE TO NEXT LOC. THIS LOC IS AT CONF OF TOE & WETLAND AREA

1117 INIT SAMPLING OF SS005 LOC AT FORMER BRICK AREA. SOIL IS MOIST SILTY SAND. DARK- CHEMETCO SPLITS

JK 5/28/98

1125 PHOTO JK2-5 FACING W AT SAMP LOC SS005. THIS LOC IS EASTERNMOST SAMP LOC (OF 4) WITHIN FORMER BRICK AREA, EAST OF MAIN PLANT ROAD.

1129 INIT SAMPLING AT SS006, MAT IS DARK BROWN SILTY SAND W/ POT OIL BASED SUPPRESSANT. CHEMETCO SPLITS

1134 PHOTO JK2-6 FACING S AT SAMP LOC

5/28/98 DK

1135 MOVE TO NEXT SAMP LOC. SS007.

1138 INIT SAMPLING AT SS007. MAT IS A MOIST SILTY CLAY DARK BROWN. CHEMETCO SPLITS

1145 PHOTO JKZ-7 FACING E AT SS007 LOC IS APPROX 50' EAST OF MAIN FACILITY ACCESS ROAD.

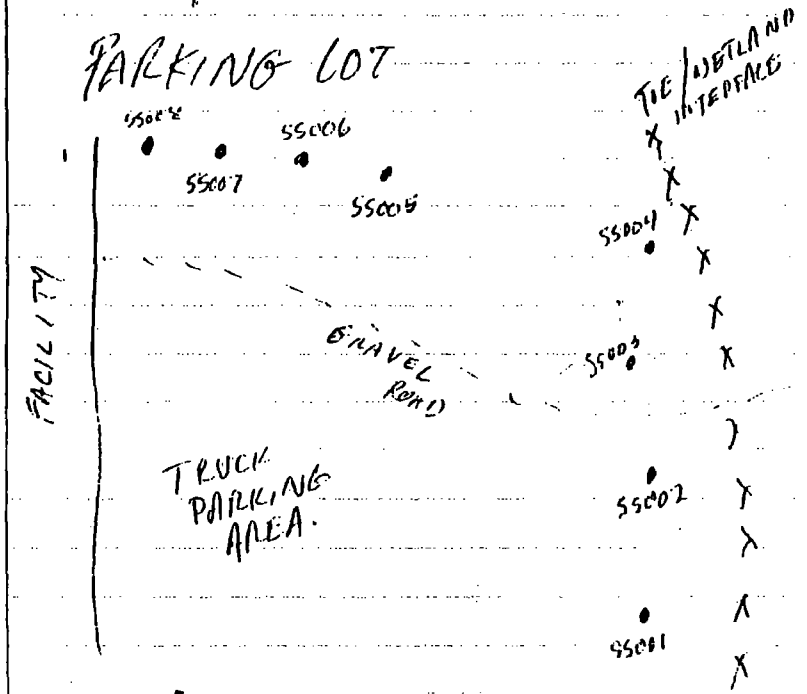
DK 5/28/98

1148 INIT SAMP AT SS008. MAT IS DARK BROWN SILTY SAND W/ MOD ORGANIC MAT & SLIGHTLY MOIST. CHEMETCO SPLITS.

1156 PHOTO JK-2-8 FACING N AT SS008. SOIL SAMP COMPLETED RETURN TO VEHICLES SED SAMP OK. 3 SAMPLES COLLECTED W/ SW AS WELL AS 1 SOIL BKGD.

5/28/98 CDK

1222 AT VEHICLES AWAITING COMPLETION OF SED 004. DISCUSS REM SAMP W/ PK. WILL LIKELY SAMPLE 3 SED/SW LOC AT TOE OFF PARKING LOT



X APPROX SOIL SAMP LOCS

5/28/98

1300 SED SAMPLING & SW WRAPPING UP W/IN WETLAND/CONT BASIN & CREEK. BREAK FOR LUNCH, OFF SITE.

1400 RET FROM LUNCH & PROCEED TO TRUCK PARKING AREA & SET UP TO SAMPLE SEDS & SW AT LOC EAST OF TOE. SAMP LOCATIONS ARE APPROX 15' EAST OF TOE DIP.

12

5/28/98 YJK

1500 JK PREP DECON/ STAGING AREA. WILL LIKELY BE TO SLAG PILE & OFFSITE AREA TO NORTH PORTION OF FACILITY. PK, HY & JK REV POT SAMPLING LOCS & TYPES OF MAT THAT WOULD/ SHOULD BE SAMPLED. SET OUT PRELIMINARY LOCs FOR FINE SLAG. WILL BETTER DEFINE SAMP LOCs LATER

OK 5/28/98

1707 INIT SAMPLING AT SLAG AREA. SAMPLE COLL AS SL001 WITH MS/MSD AND DUPLICATE SL101.

SAMPLE AREA DIV INTO 3 SECTIONS. SAMP COLL FROM TOP & BOTTOM W/ 5-6 SCOOPS FROM EACH AREA. MAT IS THEN COMP/HOMOG & THE SAMP CONTAINER(S) FILLED. CHEMETCO SPLITS

5/28/98 JK

1719 SET UP AND SAMPLE AT SL-002 SAMP FOR METALS ONLY CHEMFCO SLAGS. MAT IS FINE DARK BLACK/ GREY SLAG

1730 IN-I SAMPLING OF SL 003. LOC IS WITHIN EXC AREA WITH SLAG FED BY CONVEYORS. SAMP IS MED/COARSE SLAG (<1/4") DARK GREY/BLACK

JK 5/28/98

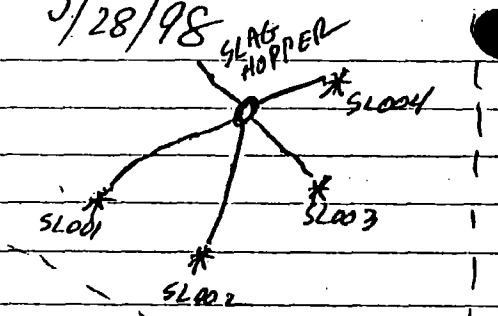
1745 INIT SAMPLING AT SL004. SLAG MAT VARIES IN SIZE FROM ≈1" TO 4" PIECES. * PROC DEVIATION. DUE TO INABILITY TO REDUCE PARTICLE SIZE IN FIELD, THE SAMPLE MAT WOULD NOT FIT IN 8 OZ JAR HENCE A ZIPLOC BAG WAS USED AS A SAMPLE CONTAINER *

5/28/98 JHC

1750 PROCEED TO PET TO EACH SAMPLE LOC & COLLECT 3 SCOOPS FROM EACH LOC, TO BE COMP & HOMOG INTO ONE COMP SAMPLE.

1752 INIT COLLECTION OF SL005. SL005 IS A COMPOSITE OF ALL OTHER LOCS. MOST MAT IS FINE TO MED GRAIN SLAG W/ SOME LARGE SIZES

5/28/98 JHC



SL005 = COMP OF SL001 – SL004

* AKM REC PHOTOS OF THESE SAMPLE LOCS

APPROX SLAG SAMPLE LOCATIONS FOR SL001 THROUGH SL005.

1820 COMPLETE AT INIT SLAG SAMP LOCS. PROCEED TO OFFSITE STL. SAMP LOC

6/28/98 CAT

1355 INIT SAMPLING AT SS012. LOC IS ON NE CORNER OF SLAG PILE (OFF-SITE)

- PHOTO JK2-9 FACING SOUTH AT SS012 SAMPLING LOCATION OFFSITE, ADJACENT TO MAIN SLAG PILE. RUNOFF

1902 INIT SAMP AT SS013.

PHOTO. JK2-10 FACING SOUTH

6/28/98 CAT

SS012 & SS013 ARE LOC TO WEST OF FACILITY FENCE / SLAG PILE & ARE GENERALLY LOCATED W/IN AREA IMPACTED BY FACILITY RUNOFF FROM MAIN SLAG PILE.

SAMP COLLECTED OF MOIST MAT, NOT SAT (LIQUID DRAINED OFF)

1938 FIELD TEAM LEAVING SITE FOR DAY. WILL DISCUSS NEXT DAYS STRATEGY @ DINNER

SQC

BLANK

05/29/98

0715 ARRIVE ON SITE FOR DAYS ACTIVITY,
- MEET WITH PLANT PERS & DEV PLAN FOR DAY

0740 PROCEED TO NW CORNER OF FACILITY.

PERSONNEL:

P. KUEFLER - USEPA
K. HIGGINS - TL
D. UPDIKE - TL
A. MUBIRU - TL
T. KOEHNEN - TL
C. DAVIS - CSD/CHEM
H. YOUNG - CSD/CHEM

5/29/98 GHK

0844 ZINC OXIDE SAMPLES FOR (ALL TOTAL METALS) AND TCLP

0830 PROCEED TO ZINC OXIDE BUNKER FOR SAMP IF GKH WILL COLLECT SAMPLES WEARING RESP. DUE TO DANGER W/ ZINC OXIDE. LOCATIONS ARE APPROX 10' W/IN MAIN ZO BUNKER AREA. NOT MUCH FURTHER DUE TO IN-STABILITY OF AREA.

GHK 5/29/98

0833 PHOTOS

JK 2-11 FACING S AT ZINC OXIDE

JK 2-12 SE AT ZINC OXIDE

JK 2-13 W AT ZINC OXIDE

855 KH 2-14 S @ ZO-003

KH 2-15 S @ ZO-002

KH 2-16 S @ ZO-001

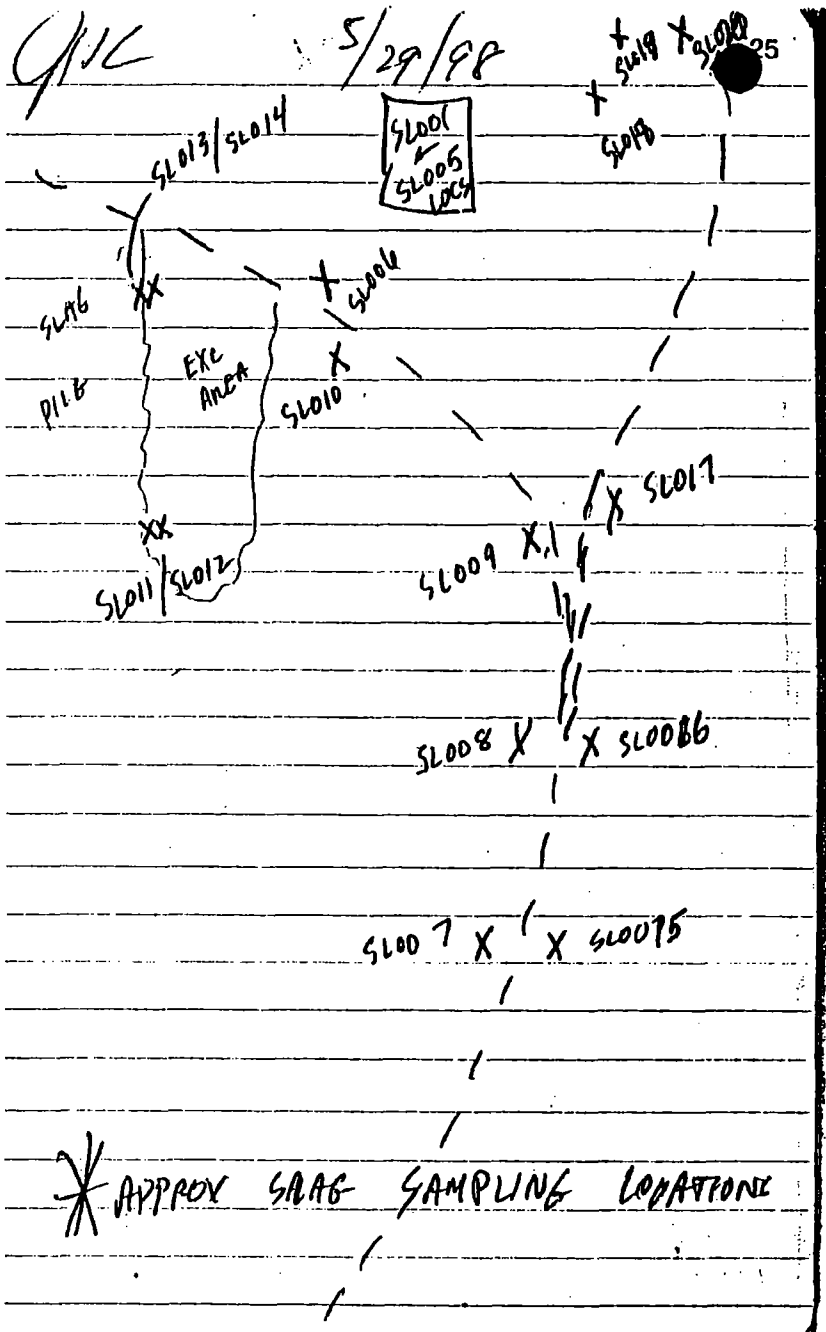
5/29/98 QK

0915 COMPLETED SAMP AT 20 BUNKER, RETURN TO STAGING AREA - DU/AM HAD SAMP BAGHOUSE & HAVE RET TO STAGING AREA

0955 ARRIVE AT UPPER SLAG PILE AREA.. PREP TO SAMPLE AT MULT LOCS.

WILL STAKE OUT SAMP LOC ALONG ROAD & COLLECT

QJC 5/29/98



5/29/98 JK

1046
INITIATE SAMP AT
SL007. MAT IS W/IN
SLAG PILE

-PHOTO JK2-17 OF
SAMP LOC SL007
SAMP COLLECTED USING
SPOON AND INTO JAR
DIRECT FILL, NO COMP DUE
TO LARGE GRAIN SIZE
1057 INIT SAMPLING
OF SL015
PHOTO JK2-18
OF SL015 LOC.

JK 5/29/98

* SAMP PROTOCOL/PROC.
IF MAT IS SMALL TO MED
GRAIN THEN SAMP COLL FROM
3 LOC W/IN SAMPLE AREA
INTO BOWL & HOMOG. IF
LARGE SIZE, SAMP COLLECTED
FROM 3 AREAS INTO CONT.
1106 INIT SAMPLING
AT SL008.
PHOTO JK2-19
FACING W AT SAMP
LOC WITHIN EXL AREA.

5/29/98 GK

1115 INIT SAMPLING AT SL016. LOC ADJ TO ROAD

PHOTO JK2-20 FACING EAST AT SAMP LOC. MAT IS FINES TO SMALL COBBLES. SAMP DIRECTLY INTO CONT FROM 3 LOC's.

* NOTE. DUE TO LARGE SIZE OF SOME SLAG. SAMPLE IS COLLECTED INTO ZIPLOC AS MAT WILL NOT GO INTO CONT.

GK 5/29/98

1123 SL017. INIT SAMPLING. DUE TO NATURE OF MATERIAL SAMPLES COLLECTED INTO ZIPLOCS. * DEV FROM PROT.

PHOTO JK2-21 OF SL017 SAMP LOC. FACING SW. SAMP LOC IS W/IN GROUPING OF 3 LOCS

1140 INIT SAMP AT SL018. SAMP MED GRAIN. COLLECTED INTO BROWN & HOMOG.

5/29/98 GK

1148 INIT SAMPLING AT SL019. SAMP COLL & HOMOG W/IN SS BOWL.

GK

GK 5/29/98

1150 INIT SAMP AT SL020. W/IN GROUP OF 2, LOCs

1153 PHOTO JK2-22 PHOTO FACING WEST AT LOC SL018-SL020 SAMPLE LOCATIONS ARE AT TOP OF MAIN SLAG PILE IN AREA W/ NOTED VARIABILITY OF SLAG TYPES/ SIZES. LOCATIONS ARE APPROX 15' APART

5/29/98 JK

PROCEED TO LOWER SLAG-
PILE LOC, ALONG ROAD
& ON WALL OF SLAG PILE
W/IN EXC AREA.

1208 INIT SAMPLING AT
SL006. LOC IS W/IN
ROADBED TO RIGHT
- SAMP COLL W/ AUGER
INTO SG & INTO CONTAINER

PHOTO JKZ-23 FACING
EAST AT SAMP LOC
SL006

JK 5/29/98

1213 INIT SAMPLING
OF SL014. MAT'L IS
LOWER HALF OF LT GRAY
DARK GRAY SLAG FINES
HORIZON. MAT IS MOSTLY
FINES.

PHOTO JKZ-24 FACING
WEST AT SLAG SAMP
LOCATIONS SL013/SL014
(013 UPPER/014 LOWER)

5/29/98 JK

1214 INIT SAMP OF SL013 UPPER STRATA. MAT IS DARK GRAY FINES & NOTED DIFF COLOR FROM LOWER

1217 PHOTO JK2-25 FACING S AT SLAG PILE & EXC AREA. SLAG PILE HAS NOTABLE VARIATS IN STRATA / SLAG W/ COLOR & SOME TEXTURE VARIATIONS

JK 5/29/98

1225 INIT SAMPLING AT SL012. SAMPLE MAT & MED GRAINSIZE SLAG WHICH WILL BE COLLECTED INTO ZIPLOC BAG DUE TO MAT SIZE. BAG IS MARKED/LAB & PLACE W/IN SECND BAG & COOLER

1230 INIT SAMPLING AT SL011. SAMPLE/DUP & MS/MSD COLLECTED

5/29/98 OK

COMPLETE AT SL011 & 012

MOVE TO NEXT LOC

SL009.

1242 INIT SAMPLING

AT SL009. LOC IS

ALONG ROADSIDE AND

COLLECTED ALONG FACE

OF SLAG PILE AFTER

EXC OF OUTER MATERIAL

OK 5/29/98

OK

BLANK

5/29/98 CK

1307 LEAVE SLAG PILE AREA & SITE FOR LUNCH BREAK WILL RETURN @ EXCAVATOR & PROC TO STAGING AREA

1347 RETURN TO SITE FROM LUNCH. PROCEED TO OFFICE TO PICK UP HEATHER/CINDY

1404 RETURN TO DECON/ STAGING AREA. WILL PREP FOR BRICK & POT WATER COOLED SLAG SAMP. WHICH IS LOC ALONG SO BORDER

JK 5/29/98

1420 PROC TO BRICK AREA AREA CONSISTED OF MOD PILES OF SLAG/SOIL/BRICK UNIT IS APPROX 20' WIDE BY 100' LONG AND ≈ 10'+ HIGH.

1440 PHOTO JK 2-26 FACING N AT SAMPLE MAT FOR RB003. MAT IS QUARTERED + BRICK SPLIT W/ CHEMTCO AND CONTAINED W/IN 2 ZIPLOCS SPLITING ACCOMP W/ HAMMER & CHISEL

5/29/98 GJK

1445 INIT SAMP OF RB004, SAMPLE IS REF BRICK, SPLIT INTO MULTIPLE PIECES & PORTIONED INTO SAMP CONT (2 ZIPLOC)

1455 INIT SAMP AT RB005. MAT IS RB SPLIT INTO SMALLER PIECES & COLLECTED INTO ZIPLOC BAGS FOL ANALYSIS. PIECES OF MOD/LARGE SIZE.

GJK 5/29/98

1505 SAMP COLLECTION OF SCRAP MATERIALS WITHIN REFRACTORY BRICK PILE

1520 RET TO RECON/ DECON AREA. WILL GO TO DECON PAD TO DIS POSE OF FDW & PPE W/ HERITAGE, HERITAGE ALREADY AWAITING TL TO PICKUP BARRELS OF DECON WATER & PPE

5/29/98 JK

1540 AT DEGON AREA PREPARING DRUMS FOR RELINE TO HERITAGE- DRUMS SEALED, LABELLED & MANIF TO HERITAGE BY PK

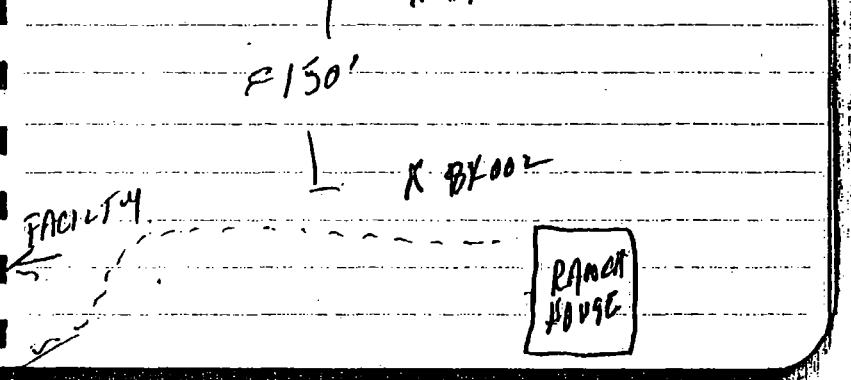
1557 HERITAGE PICKUP COMPLETED VAN

1600 JK TAKING PK BACK TO MAIN OFFICE AREA. PL TO REMAIN ON SITE TO COLLECT BACKGROUND SAMPS

JK 5/29/98

1605 ARRIVE AT CHEMETCO RANCH HOUSE, LOC IS FAR EASTERN AREA OF SITE. WILL COLLECT 2 PICKED SAMPS OF SOIL FROM AREA.

1609 INIT SAMPLING AT BK 002. SAMP MAT IS MED CLAY. BROWN



5/29/98 GK

1610 PHOTO JK2-26 FACING SSE AT BACKGROUND SAMPLE LOCATION 2 (BK-002) LOC IS APPROX 50' NORTH OF RANCH HOUSE DRIVEWAY. LOC WAS COVERED W/ GRASS. HAND AUGER USED TO COLLECT SAMP FROM SOIL SURF TO ~6' BGS (0"-6" BGS)

5/29/98 GK

1620 PHOTO JK2-287 FACING SOUTH AT SAMPLE LOCATION FOR BK-003. THIS LOC IS APPROX 150' EAST OF BK-002.

1625 SAMPLE COLLECTED TEAM RET TO MAIN OFFICE AREA. COMPLETE FOR DAY

1650 TL LEAVING SITE FOR DAY/ACT

5/29/98 OK

OK

BLANK

Logbook # 3

"Rite in the Rain®"

ALL-WEATHER

SPIRAL FIELD NOTEBOOK

No. 185

Chemetco Sampling Event
Techlaw, Inc.
May 28th - 29th, 1998
Hartford, IL
(Kevin Higgins)

8 1/2" x 11"

5/28/98 Chemetco Sampling

0725 - Arrived @ facility and met w/ Heather Young; waited for Cindy Davis, Chris C. (IEPA); Chris did not arrive

0730 - Cindy Davis, Heather Young } CSD Environmental Services
Patrick Kuefler - USEPA, Region 5
John Koehnen, Kevin Higgins, Anthony Mubiru, ~~Kevin Higgins~~ KRH, Doug Updike } TechLaw, Inc. Personnel

0730 - Pat outlines basic sampling agenda for 2-day event
- Facility requests splits on sw/sed., brick, slag samples taken by TechLaw
- Facility will not split Zinc Oxide

0745 - Left for general "recon" of southside of facility

0800 - "Recon" of sw/sed. areas; Dropped off IDW drums @ area known as "Decon Pad"; checked-on maintenance building area where decon. ~~area~~ KRH water (potable) water can be obtained
- Flagged sw/sed. and "Toe" soil samples

0915 - Flagged sw/sed. samples to the west of Containment #3; Flagged Background Soil sample;

10:20 - Took sw/sed. - 1 samples; MS/MSD and ED (for SW/SED-2)

~~10:2 KH~~ 10:40 - Took sw/sed, ~~2 SED~~ - 1 EQ-Blank Material - bagged for ED (later)

11:10 - SW/SED-2 Location Sampling

11:30 - Bkg - 1 (BK-1) Sample Collection; soil is mostly clay w/ small amount of organic matter on top (≈ 2 inches); packed sampling equipment

12:00 - Re-packed equipment and checked samples

12:25 - Took SW/SD - 3 samples; SD sample more clayey than SD-1 and SD-2

12:35 - Lunch

13:30 - Returned to site; set-up Van and "decon" area

13:50 - Decon. bowls, augers, spoons @ decon area in parking lot

14:30 - Equipment Blank SS-301 on bowls, augers, spoons; decon consists of alconox/Liquinox wash w/ DI rinse

~~KH~~ 5/29/98

16:10 - Took Equipment Blank SD-306 on auger, spoon, bowl used in sampling SD-006

16:15 - Empty "decon" water in drum (from sampling SD-1 thru. SD-6) and from SS-1 thru. SS-8

16:30 - Main Site recon. and pH of SW/SD-B location

17:10 - Collection of SW-007; "in situ" field measures as follows: pH = 10.34; Cond. = 29.5 ms/cm; Turb. = 36.0 NTU; Temp. = 33.6 °C; DO = 2.3 mg/L

17:10 - Camera 3, P-1: Looking East: Location of SW/SD-007

17:11 - " " P-2: " SW: Stormwater ponds

17:11 - " " P-3: " SE: " "

17:30 - Recon. of SW/SD and SS samples to the East of the Main site facility [N/Curis (IEPA) and Cindy Davis]

18:25 - Sampled SS-009 Location ≈ 30' East of MW-26 and ≈ 250' North of SE corner of Facility fenceline

18:30 - Sampled SS-010 ≈ 80' North of SS-009

18:40 - " SS-011

18:55 - SW-008 pH= Sample Collection; Horiba field measures as follows: 11.17; Cond. = 20.8; Turb = 181; Temp. = 20.0 °C

18:55 - SS-012 Sample Collection

19:02 - SS-013 Sample Collection

19:35 - Left Site

5/29/98

7:35 - Arrived @ site and met w/ Cindy and Heather (ESD)

8:00 - Decon @ NW corner of Main Site

5/28/98 Chemetco Sampling

8:40 - Znox. sampling; Bunker Storage Area
8:45 - ~~ZO~~-003
8:50 - ZO-002
8:50 - ZO-001
9:00 - Pack-Up and return to decon area @ NW corner of Main Site

All samples Taken in Bunker; ZO-001 composite Homogenized (FD and MS/MSD

- Pat. K requested Total Metals/TCLP on Bunker samples

9:20 - Sample Labeling BD and ~~ZO~~-004 (Filter Press)

0953 - CAMERA #3 - DIRECTION: NE - BUCKET OF ZnO2 RETRIEVED - SAMPLE WAS COLLECTED FROM THIS BUCKET ↑ FILTER CAKE PRESS

0955 - SAMPLE ZO-004 COLLECTED. 1X8OZ AMBER JAR FOR TCLP METALS & TOTAL RCRA METALS

0955 - Camera 3 ~~PEOPLE~~ ZO-004 Sample Location @ Southside (SW-Side) of DIS Building (Facing North)
Camera 3 - No. 2 Baghouse (aka Roof Baghouse) (N-NW)

1015 - COLLECT BD-002 SAMPLE FROM BAGHOUSE #2. 1X8OZ AMBER JAR FOR TCLP METALS. Sampled out of Second Apartment from South End; 2 photos of BD-002 Sample Location

1025 - No. 1 Bghouse (Series AAF - American Air Filter) - Sample BD-001 w/FD and MS/MSD - Location is East of Main Foundry Building; Photo - SE - BD-001 sample location.

1030 - Photo (South) of Facility Area west of Slag Granulation Baghouse

1045 - COLLECT BD-003 SAMPLE FOR TCLP METALS 1X8OZ AMBER JAR. COLLECTED FROM PRIMARY BAGHOUSE SLAG GRANULATION PLANT. CAMERA #3 PHOTO OF COLLECTION/DUST COLLECTION BIN AND INSIDE OF BIN - NW DIRECTION.

1055 - COLLECT SAMPLE BD-004 FOR TCLP METALS 1X8OZ AMBER JAR FROM SECONDARY BAGHOUSE @ SLAG GRANULATION PLANT

5/28/98 Chemetco Sampling

11:00 - BD-004 sample location photo (SW)
11:20 - Went back to decon area; re-grouped samples and sampling gear
11:40 - Sampling slag @ NE corner of Unit 5
- CSD not using ice when splitting samples - simply putting samples in bucket
12:00 - sampling slag; John K. taking notes
13:00 - Left site for Lunch
14:00 - RB sampling - J. K. taking notes
16:20 - BK sampling
16:45 - Left site

APPENDIX D

CHAIN-OF-CUSTODY FORMS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

TechLaw KRH 6/1/98

A.T. KEARNEY

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11101

Project Code: 1205-020	Samples Shipped To: QST Environmental 404 SW 104th Terrace Newberry, FL 32669	Samplers Names: Doug Updike, Kevin Higgins	1) Sample description (Enter in column A): 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil/Sediment; 6. Oil; 7. Waste; 8. Other (specify)
Project (site) Name: CIHI			2) Preservatives (Enter in column B): 1. HCl; 2. HNO_3; 3. $NaHSO_4$; 4. H_2SO_4; 5. NaOH; 6. Other (specify); 7. Ice only; N. Not preserved
City, State, Zip Code	Carrier: FEDEX	Samplers Signatures: Kevin Higgins	
Date Shipped: 6/1/98	Air Bill Number: 805774443276		

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: TCLP Metals	TBRK51	TBRK52	MS/MSD		Remarks/ Tag Numbers
RB-001	7	7	G	1	5/29/98, 14:30	✓			MS/MSD	*1	5-176917
RB-002	7	7	G	1	5/29/98, 14:35	✓				*2	5-176918
RB-003	7	7	G	1	5/29/98, 14:40	✓				*3	5-176919
RB-004	7	7	G	1	5/29/98, 14:45	✓				*4	5-176920
RB-005	7	7	G	1	5/29/98, 14:50	✓				*5	5-176921
RB-006	7	7	G	1	5/29/98, 15:05	✓		↓		*6	5-176922

KRH 6/1/98

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
Kevin Higgins	18:00	6/1/98	Jennifer Long QST	1200	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks: Cooler Temp = 5°C

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc.
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

Page 1 of 1

A.T. Kearney 1/3907/1 TR

0007

JK 6/3/98 18:30

TechLaw 6/1/98 KRH

A.T. KEARNEY

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11109

Project Code: ROS-020	Samples Shipped To: QST Environmental 404 SW. 104th Terrace Newberry, FL 32669	Samplers Names: Kevin Higgins Doug Updike	1) Sample description (Enter in column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)
Project (site) Name: CIH1			2) Preservatives (Enter in column B): 1. HCl 2. HNO_3 3. $NaHSO_4$ 4. H_2SO_4 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
City, State, Zip Code	Carrier: FEDEX	Samplers Signatures: Kevin Higgins	
Date Shipped: 6/1/98	Air Bill Number: 805974443276		

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: RCRA Metals	TCLP Metals	TBRKS1						Remarks/ Tag Numbers
SL-003	7	7	G	1	5/28/98, 17:30		✓	TBRKS2					*7	5-176895
SL-004	7	7	G	1	5/28/98, 17:45		✓						*8	5-176896
SL-005	7	7	G	1	5/28/98, 17:45		✓						*9	5-176898
SL-006	7	7	G	1	5/29/98, 12:08		✓						*10	5-176899
SL-007	7	7	G	1	5/29/98, 10:46		✓					*11	*10	5-176897
SL-008	7	7	G	1	5/27/98, 11:06		✓						*12	5-176900
SL-009	7	7	G	1	5/29/98, 12:42		✓						*13	5-176901
SL-010	7	7	G	1	5/29/98, 12:48		✓						*14	5-176902
SL-011	7	7	G	3	5/29/98, 12:30		✓	↓			MS/MSD		*15	MS/MSD: 5-176905, 5-176904, 5-176903 (2)
SL-111	7	7	G	1	5/29/98, 12:30		✓						*16	5-176906

KRH 6/1/98

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
Kevin Higgins	18:10	5/31/98	Jerry Pugh QST	1200	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks: Cooler temp = 4°C

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc.
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

KRH 6/3/98 18:55

A.T. Kearney 1/3907/1 TR

8000

TechLaw 6/1/98 KRH

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11099

Project Code R05-020	Samples Shipped To CST Environmental 404 SW 104th Terrace Newberry, FL 32669	Samplers Names Kevin Higgins	1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)
Project (site) Name CIHI			2) Preservatives (Enter in column B) 1. HCl 2. HNO_3 3. $NaHSO_4$ 4. H_2SO_4 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
City, State, Zip Code	Carrier FEDEX	Samplers Signatures Kit Higgins	
Date Shipped 6/1/98	Air Bill Number 805974443276		

Sample Identification Numbers		A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: RCRA Metals	Analysis: TCLP Metals								Remarks/ Tag Numbers
TBRKS1																
ZO-001 MS/MSD	17	7	7	G	3	5/29/98, 09:50	✓	✓	SL=	TBRKS1.2						MS/MSD: 5-176963, 5-176961, 5-176962
ZO-101	18	7	7	G	1	5/29/98, 09:50	✓	✓		↓						5-176964
ZO-002	19	7	7	G	1	5/29/98, 09:50	✓	✓								5-176965
ZO-003	20	7	7	G	1	5/29/98, 8:45	✓	✓								5-176966
ZO-004	21	7	7	G	1	5/29/98, 7:55	✓	✓								5-176967
~~ZO-005~~		~~7~~	~~7~~	~~G~~	~~1~~	~~5/29/98,~~	~~✓~~	~~✓~~								~~5-176968~~ KRH
SD-001 MS/MSD	22	5	7	G	3	5/28/98, 10:40	✓			TBRKS1.2						MS/MSD: 5-176969, 5-176970, 5-176968
SD-101	03	5	7	G	1	5/28/98, 10:40	✓			↓						5-176971
SD-002	24	5	7	G	1	5/28/98, 11:20	✓									5-176972
SD-003	25	5	7	G	1	5/28/98, 12:15	✓									5-176973
SD-008	26	5	7	G	1	5/28/98, 18:55	✓									5-176974
SL-001 MS/MSD	27	7	7	G	3	5/28/98, 17:07		✓		TBRKS1						MS/MSD: 5-176991, 5-176989, 5-176990
SL-101	28	7	7	G	1	5/28/98, 17:07		✓		↓						5-176992
SL-002	29	7	7	G	1	5/28/98, 17:19		✓								5-176994

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
Kit Higgins	18:00	6/1/98	Jim Kupp CST	1200	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks Perform RCRA Metals and RCRA TCLP Metals Analyses on all "ZO" samples

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc. Cooler Temp = 4°C
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

KRH 6/3/98 18:40

A.T. Kearney 1/3907/1 TR

6000

Techlaw 6/1/98 KRH

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11104

Project Code	Samples Shipped To	Samplers Names	1) Sample description (Enter in column A)	2) Preservatives (Enter in column B)
RD5-020	QST Environmental 404 SW 104th Terrace Newberry, FL 32669	Kevin Higgins Doug Updike	1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)	1. HCl 2. HNO_3 3. Na HSO_4 4. H_2SO_4 5. Na OH 6. Other (specify) 7. Ice only N. Not preserved
Project (site) Name: CIH1				
City, State, Zip Code	Carrier: FEDEX	Samplers Signatures: Kevin Higgins		
Date Shipped: 6/1/98	Air Bill Number: 805774443276			

Sample Identification Numbers		A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: RCRA Metals	TCLP Metals							Remarks/ Tag Numbers
BK-001	#30	5	7	G	1	5/28/98, 11:40	✓		TBLKS12						KRH MS/MSD 5-176944,
BK-002	31	5	7	G	1	5/29/98, 16:10	✓								5-176945
BK-003	32	5	7	G	1	5/29/98, 16:25	✓								5-176946
SS-009	33	5	7	G	1	5/28/98, 18:25	✓								5-176947
SS-010	34	5	7	G	1	5/28/98, 18:30	✓								5-176948
SS-011 MS/MSD	35	5	7	G	KRH 2	5/28/98, 18:35	✓								5-176949 5-176950 MS/MSD
SS-012 KRH	111 36	5	7	G	1	5/28/98, 18:35	✓								5-176951
SS-012	37	5	7	G	1	5/28/98, 18:55	✓						6/2/98		5-176952
SS-013	38	5	7	G	1	5/28/98, 17:02	✓								5-176953
BD-001 MS/MSD	39	7	7	G	3	5/29/98, 10:25	KRH ✓		TBLKS13				TBLK11		5-176954, 5-176955 MS/MSD
BD-101	40	7	7	G	1	5/29/98, 10:25		✓							5-176957
BD-002	41	7	7	G	1	5/29/98, 10:15		✓							5-176958
BD-003	42	7	7	G	1	5/29/98, 10:45		✓							5-176959
BD-004	43	7	7	G	1	5/29/98, 10:55		✓							5-176960

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
Kevin Higgins	18:00	6/1/98	[illegible] QST	0206	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks: Archive all "SS" samples after performing RCRA Metals Analysis

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc. Cooler Temp = 4°C
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

A.T. Kearney 1/3907/1 TR

6/3/98 18:45

00010

Techlaw KRH 6/1/98

A.T. KEARNEY

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11103

Project Code: ROS-020	Samples Shipped To: QST Environmental 404 SW 104th Terrace Newberry, FL 32669	Samplers Names: Kevin Higgins	1) Sample description (Enter in column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)
Project (site) Name: CIHI			2) Preservatives (Enter in column B): 1. HCl 2. HNO_3 3. $NaHSO_4$ 4. H_2SO_4 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
City, State, Zip Code	Carrier: FEDEX	Samplers Signatures: Kevin Higgins	
Date Shipped: 6/1/98	Air Bill Number: 805974443276		

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: ECPA Metals	TCLP Metals							Remarks/ Tag Numbers
SL-012 TBRKS1 *44 *50	7	7	G	1	5/29/98, 12:25		✓	TBRKS1	*Kevin	TBRKS1				5-176908
SL-013 *45	7	7	G	1	5/29/98, 12:14		✓			⊕ TBRKL1				5-176909
SL-014 *46	7	7	G	1	5/29/98, 12:13		✓							5-176910
SL-015 *47	7	7	G	1	5/29/98, 10:57		✓							5-176911
SL-016 *48	7	7	G	1	5/29/98, 11:15		✓							5-176912
SL-017 *49	7	7	G	1	5/29/98, 11:23		✓							5-176913
SL-018 *50	7	7	G	1	5/29/98, 11:48		✓							5-176914
SL-019 *51	7	7	G	1	5/29/98, 11:45		✓							5-176915
SL-020 *52	7	7	G	1	5/29/98, 11:50		✓							5-176916
MS/MSD SW-001 TBRKW1 *1	1	2,7	G	3	5/28/98, 10:20	✓		TBRKW1					MS/MSD	5-176924, 5-176925, 5-176926
SW-101 *2	1	2,7	G	1	5/28/98, 10:20	✓								5-176923
SW-002 *3	1	2,7	G	1	5/28/98, 11:15	✓								5-176927
SW-003 *4	1	2,7	G	1	5/28/98, 12:15	✓								5-176931
SW-008 *5	1	2,7	G	1	5/28/98, 18:50	✓								5-176928

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
Kevin Higgins	18:00	6/1/98	Kevin King	1200	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks: Cooler Temp = 5°C

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc.
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

Page 1 of 2

A.T. Kearney 1/3907/1 TR

0001I

a/M 6/3/98 18:50

TECHLAW
~~A.T. KEARNEY~~ DJH 5-28-98

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11112

Project Code: RD5-020	Samples Shipped To: QST Environmental 404 SW 104th Terrace Newberry, FL 32669	Samplers Names: Douglas J. Updike, John Koehnen, Kevin Higgins	1) Sample description (Enter in column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)
Project (site) Name: CIHI			2) Preservatives (Enter in column B): 1. HCl 2. HNO_3 3. $NaHSO_4$ 4. H_2SO_4 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
City, State, Zip Code	Carrier: FEDEX	Samplers Signatures	
Date Shipped: 6/1/98	Air Bill Number: 805174443276		

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: RCRA Metals		Remarks/ Tag Numbers
SW-006 TBRKW1*6	1	2	G	1	5-28-98/1530	X	TBRKW1	#5-176939
SD-006 TBRKS1*53	5	7	G	1	5-28-98/1540	X	TBRKS1.2	#5-176940
SD-306 TBRKW1*7	4	2	G	1	5-28-98/1605	X	TBRKW1	#5-176941
SW-007 TBRKW1*8	1	2	G	1	5-28-98/1710	X	TBRKW1	#5-176943
SD-007 TBRKS1*54	5	7	G	1	5-28-98/1720	X	TBRKS1.2	#5-176942

TBRKS1*54

KRH 6/1/98

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
Kevin Higgins	13:00	6/1/98	[illegible]	1200	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks: Cooler Temp = 3°C

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc.
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

Page 2 of 2

A.T. Kearney 1/3907/1 TR

00012

6/5/98 18:55

Techlaw

~~A.T. KEARNEY~~

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11106

Project Code: RDS-020	Samples Shipped To: QST Environmental 404 SW 104th Terrace Newberry, FL 32669	Samplers Names: Kevin Higgins	1) Sample description (Enter in column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)
Project (site) Name: CIH1			2) Preservatives (Enter in column B): 1. HCl 2. HNO_3 3. $NaHSO_4$ 4. H_2SO_4 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
City, State, Zip Code	Carrier: FEDEX	Samplers Signatures: Kevin Higgins	
Date Shipped: 6/1/98	Air Bill Number: 8059744		

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: RCRA Metals	TCLP Metals	Remarks/ Tag Numbers
SL-301 TBRKW1X9	4	2,7	G	1	5/29/98, 15:10	✓	TBRKW1	5-176730
SL-311 *10	4	2,7	G	1	5/29/98, 15:10	✓		5-176907
SLRH SL-301 *11	4	2,7	G	1	5/28/98, 14:35	✓		5-176729

KRH 6/1/98

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
Kevin Higgins	18:00	6/1/98	[signature]	1200	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
			[signature]								

Remarks

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc.
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

Page 2 of 2

NF 6/3/98 18:55

A.T. Kearney 1/3907/1 TR

00013

TechLAW

A.T. Kearney
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11111

Project Code	Samples Shipped To	Samplers Names	1) Sample description (Enter in column A)	2) Preservatives (Enter in column B)
RDS-020	QST Environmental 404 SW 104th Terrace Newberry, FL 32669	DOUGLAS J. UPDIKE JOHN KOEHNEN Kevin Higgins	1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)	1. HCl 2. HNO_3 3. $NaHSO_4$ 4. H_2SO_4 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
Project (site) Name: CIHI				
City, State, Zip Code	Carrier: FEDEX	Samplers Signatures		
Date Shipped: 6/1/98	Air Bill Number: 805974443276			

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis: RCRA Metals							Remarks/ Tag Numbers
SS-001/TBRKS1*55	5	7	G	3	5-28-98/1002	X	SL=TBRKS12						5-176991 #5-176999 MS/MSD 5-176988
SS-101 56	5	7	G	1	5-28-98/1002	X							#5-176993
SS-002 57	5	7	G	1	5-28-98/1025	X							#5-176994
SS-003 58	5	7	G	1	5-28-98/1037	X							#5-176997
SS-004 59	5	7	G	1	5-28-98/1102	X							#5-176998
SS-005 60	5	7	G	1	5-28-98/1117	X							#5-176996
SS-006 61	5	7	G	1	5-28-98/1129	X							#5-176995
SS-007 62	5	7	G	1	5-28-98/1138	X							#5-176932
SS-008 63	5	7	G	1	5-28-98/1148	X							#5-176933
SW-004/TBRKW1*12	1	2	G	1	5-28-98/1400	X	TBRKW1						#5-176934
SD-004/TBRKS1*64	5	7	G	1	5-28-98/1410	X	TBRKS1.2						#5-176935
SW-005 TBRKW1*13	1	2	G	1	5-28-98/1440	X	TBRKW1						#5-176936
SD-005 TBRKS1*65	5	7	G	1	5-28-98/1450	X	TBRKS1.2						#5-176937
SS-311/TBRKW1*14	4	2	G	1	5-29-98/0825	X	TBRKW1						#5-176938

Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date
[illegible]	18[illegible]	6/1/98	Jeni Kemp QST	1200	6-2-98						
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks: Archive all "SS" samples after performing RCRA Metals Analysis

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc. Cooler Temp 5°C
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

Page 1 of 2

A.T. Kearney 1/3907/1 TR

6/3/98 19:00

00014

QST COOLER RECEIPT FORM

THIS FORM IS TO BE EXECUTED BY THE QST SAMPLE RECEIPT CUSTODIAN WHEN PROCESSING SHIPPING CONTAINERS.
ANY *No IS TO BE DESCRIBED IN *DETAILS/COMMENTS. IMMEDIATE DOCUMENTATION OF PROBLEMS TO THE ANALYTICAL PROJECT MANAGER WILL FACILITATE COMMUNICATION WITH THE CLIENT TO RESOLVE ANY PROBLEMS.
REFER TO ACTUAL CHAIN-OF-CUSTODY AND AIRBILL (IF APPLICABLE) FOR ADDITIONAL SAMPLE DOCUMENTATION.

Project: Tech Land Shipping Container # (QST / Other): 2089
Received (mm/dd/yr/hr): 6-2-98 1200 By:
Opened (if different) : By:

Preliminary Examination Checklist

Did the shipping container arrive with an airbill/shipping slip? ..... (No) Yes
If applicable, carrier name & airbill #: Airbills where removed - FedEx

Were custody seals on the outside of the container? ..... *No (Yes)
If Yes, a: were custody seals intact upon arrival? ..... *No (Yes)
b: enter Seal Date and Name (or enter "NA" if not available): 6-1-98 RRH

When the container was scanned for radioactivity, were readings within criteria? ... *No (Yes)

Was Chain of Custody (COC) documentation provided with the shipment? ..... *No (Yes)
If Yes, a: was COC fully executed by the shipper (in ink)? ..... *No (Yes)
b: did you sign the COC in the appropriate field? ..... *No (Yes)
c: was the project identifiable from the COC? ..... *No (Yes)
If No, how was this determined?

Were samples received within criteria of 2-6° C? ..... *No (Yes)

Sample Examination & Check-In Checklist Sample Temperature 5 °C

Were samples packaged in conformance to generally accepted practices? ..... *No (Yes)

Did all sample containers arrive intact and sealed? ..... *No (Yes)
Did all sample containers have secure and completed labels? ..... *No (Yes)
If sample containers possessed tags, circle: Tags only (Tags + Labels)
Were individual bottles/vials sealed with custody tape or seals? ..... (No) Yes
Did all labels and/or tags agree with COC? ..... *No (Yes)
Did volumes, containers, & preservations seem appropriate to indicated tests? ..... *No (Yes)

Did pH checks of all preserved water samples confirm indicated preservations? .... *No (Yes) N/A
(If not document sample ID, fraction and pH below)
Were any containers for cyanide analysis (B fractions) not basified (pH>7)? ..... *No Yes (N/A)
If Yes, did they pass the lead acetate test indicating no sulfides present .... *No Yes (N/A)
Were VOA vials (waters) free from bubbles? ..... *No Yes (N/A)

Was this checklist free from deficiencies requiring notification of the Lab Project Manager?
If No, note who was contacted & when in Details/Comments below) ..... *No (Yes)

Was a Multiple Cooler Supplement form used for this shipment? ..... No (Yes)

*Details/Comments:(note sample numbers)

Source: QST, September 1997 f:\admin\common\forms\1213\crf9.97

QST COOLER RECEIPT FORM

Multiple-Cooler Supplement

Project Name: Techlaw **Date Received:** 6-2-98

THIS FORM IS TO BE EXECUTED BY THE QST SAMPLE RECEIPT CUSTODIAN WHEN PROCESSING MULTIPLE COOLERS (TWO-TEN) FOR THE SAME SET OF SHIPPING CONTAINERS FOR A GIVEN PROJECT.. IT IS DESIGNED TO DOCUMENT THE IDENTITY OF EACH COOLER IN THE SHIPMENT, AND MUST ACCOMPANY THE STANDARD QST COOLER RECEIPT FORM (CRF) AND BE CLEARLY REFERENCED ON THE CRF.

EACH COOLER INCLUDED IN THIS RECEIPT IS TO BE DOCUMENTED BELOW. ANY *NO NOTED ON THE CRF IS TO BE DESCRIBED IN DETAILS/COMMENTS AND IS TO BE REFERENCED TO THE CRF COOLER # NOTED BELOW.

CRF Cooler #	Shipping Container #	Temp (°C)	pH Checked
1.	2089	4	N Y (N/A)
2.	1266	5	N Y (N/A)
3.	1483	3	N (Y) N/A
4.	NA	4	N (Y) N/A
5.			N Y N/A
6.			N Y N/A
8.			N Y N/A
9.			N Y N/A
10.			N Y N/A

Details/Comments: (note cooler and sample numbers)

DATE: 6-2-98 CRFS#: 2089

f:\admin\common\forms\1213\crf9.97

APPENDIX E

INVESTIGATIVE-DERIVED WASTE MANIFESTS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENT
P.O. Box 7035
Indianapolis, IN 46207-7035

PLEASE PRINT OR TYPE (Form designed for use on elite (12-pitch typewriter.) Form approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. ILP2000001308 | Manifest Document No. 0.0.0.1 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but items D, F, H, I and K are required by State law.

3. Generator's Name and Mailing Address
USEPA REGION V ATTN: ~~K. HIGGINS~~ P. KUEFLER
77 WEST JACKSON BLVD, CHICAGO, IL 60605-3590

4. Generator's Phone ~~(800) 621-8431~~ 312 353-6267

A. State Manifest Document Number: INA111612 ~~IL ID#1980150008~~

B. State Generator's ID

5. Transporter 1 Company Name: HERITAGE TRANSPORT | 6. US EPA ID Number: I.N.D.0.5.8.4.8.4.1.1.4 | C. State Transporter's ID: ~~IL ID#1554~~ | D. Transporter's Phone: ~~(317) 381-6848~~

7. Transporter 2 Company Name | 8. US EPA ID Number | E. State Transporter's ID | F. Transporter's Phone

9. Designated Facility Name and Site Address
HERITAGE ENVIRONMENTAL SERVICES
7901 W. MORRIS ST.
INDIANAPOLIS IN 46231

10. US EPA ID Number: I.N.D.0.9.3.2.1.9.0.1.2

G. State Facility's ID: RRIN03

H. Facility's Phone: (317) 486-2898

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol.	I. Waste No.
a ~~HAZARDOUS WASTE, SOLID, N.O.S., 9, NA3077, PGIII~~ (D004,D005,D006,D007,D008,D010,D011) ERG# 171	0 0 1	D M	XXX20	P	D004
b ~~HAZARDOUS WASTE, LIQUID, N.O.S., 9, NA3082,~~ PGIII (D004,D005,D006,D007,D008,D010,D011) ERG# 171	0 0 1	D M	XXX30	G	D004
c					
d					

J. Additional Descriptions for Materials Listed Above
A)46002-2;D005,D006,D007,D008,D010,D011
B)46002-1;D005,D006,D007,D008,D010,D011

K. Handling Codes for Wastes Listed Above: A)S01 B)T21

15. Special Handling Instructions and Additional Information
VEHICLE LICENSE# IND L29741
24 HR EMERGENCY# 314-388-3500
SITE ADDRESS: 3576 CHEMETCO LANE
HARTFORD, IL 62048

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date Month	Day	Year
Patrick Kuefler		05	27	94

GENERATOR

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
Sean Redington		05	27	94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year

TRANSPORTER

19. Discrepancy Indication Space

FACILITY

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted item 19.

Printed/Typed Name	Signature	Date Month	Day	Year
MICHAEL SWACTAJR		06	06	94

EPA Form 8700-22
Previous editions are obsolete
State Form 11865 (R2 / 1-94)

In case of a spill call the Indiana Office of Environmental Response at 317/241-4336 (day or night) and the National Response Center at 800/424-8802 or 202/426-2675.

INA111612

OFFICE OF SOLID AND HAZARDOUS WASTE MANAGEMENT
P.O. Box 7035
Indianapolis, IN 46207-7035

PLEASE PRINT OR TYPE (Form designed for use on elite (12-pitch typewriter.) Form approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. I L D 0 0 0 0 0 1 3 0 | Manifest Document No. 0.5.C.8.1 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but items D, F, H, I and K are required by State law.

3. Generator's Name and Mailing Address
USEPA REGION V ATTN: K. HIGGINS
77 WEST JACKSON BLVD, CHICAGO, IL 60605-3590

4. Generator's Phone ( )

A. State Manifest Document Number: INA1111612
B. State Generator's ID: ~~IL ID#19001500~~

5. Transporter 1 Company Name: HERITAGE TRANSPORT
6. US EPA ID Number: I N D 0 5 8 4 8 4 1 1 4
C. State Transporter's ID: IL ID01554
D. Transporter's Phone: (317) 301-6846

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
HERITAGE ENVIRONMENTAL SERVICES
7901 W. MORRIS ST.
INDIANAPOLIS IN 46231
10. US EPA ID Number: I N D 0 9 3 2 1 9 0 1 2
G. State Facility's ID: BRIN03
H. Facility's Phone: (317) 486-2898

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol.	I. Waste No.
a ~~HAZARDOUS WASTE, SOLID, N.O.S., 9, NA3077, PGIII~~ (D004,D005,D006,D007,D008,D010,D011) ERG# 171	0 0 1	D M	X X 3 0	P	D004
b ~~HAZARDOUS WASTE, LIQUID, N.O.S., 9, NA3082,~~ PGIII (D004,D005,D006,D007,D008,D010,D011) ERG# 171	0 0 1	D M	X X 3 0	G	D004
c					
d					

J. Additional Descriptions for Materials Listed Above
A)46002-2;D005,D006,D007,D008,D010,D011
B)46002-1;D005,D006,D007,D008,D010,D011

K. Handling Codes for Wastes Listed Above
A)S01 B)T21

15. Special Handling Instructions and Additional Information
VEHICLE LICENSE# I N [illegible]
24 HR EMERGENCY# 317-[illegible]
SITE ADDRESS: 3576 CHEMETCO LANE
HARTFORD, IL 62048

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: [illegible] Signature: [signature] Date: Month 09 Day 07 Year 96

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Sean Redington Signature: [signature] Date: Month 09 Day 07 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: Signature: Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted item 19.
Printed/Typed Name: MICHAEL SWAITAP Signature: [signature] Date: Month 09 Day 06 Year 96

EPA Form 8700-22
Previous editions are obsolete
State Form 11865 (R2 / 1-94)

In case of a spill call the Indiana Office of Environmental Response at 317/241-4336 (day or night) and the National Response Center at 800/424-8802 or 202/426-2675.

INA 1111612

Customer: 4504 HERITAGE ENVIRONMENTAL SERVI
Contact: ACCOUNTS PAYABLE (314)388-3500
PO number(s): 14-05197
Location(s) : 48-1

HERITAGE ENVIRONMENTAL SERVICES, INC.
7901 WEST MORRIS STREET INDIANAPOLIS IN 46231
(317)243-0811 http://www.heritage-enviro.com

Signature _____ Name (please print) _____ Date _____
This is to certify that the materials listed below are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

KEVIN HIGGINS
USEPA REGION V - CHEMETRO, INC
3576 CHEMETRO LANE
HARTFORD IL 62048

STATE ID:
EPA ID: ILP200000130
Phone: (913)236-0006
GENERATOR: 46002 XX *M*

INTL
LINER _____
PUMP/HOSE _____
DEMURRAGE _____
EMER RATE _____

TRANSPORTER: 8000
HERITAGE TRANSPORT

EPA ID: IND058484114
Phone: (317)381-4848

DRIVER# 3953
TRACTOR# 199
ROLLOFF# _____
TRAILER# 31-12

Signature Bob Querfelt Name (please print) B. QUERFELT Date 6/1/98
As transporter, I accept this material for transportation in accordance with all applicable regulations.

TSDF: 9000
HERITAGE ENVIRONMENTAL SERVICES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS IN 46231

EPA ID: IND093219012
Phone: (317)243-0811
Contact: WINDE HAMRICK

INTL
DEMURRAGE _____

Signature _____ Name (please print) M WALTRIP Date 6/2/98
As the receiving facility, I accept this material for treatment, storage or disposal in accordance with all applicable regulations.

Item	Prod	HES Doc	Common Name	RCRA	GenDoc	State Manifest	Pg Ln	Ordered Qty Unt	Shipped Quantity Unit	Received Qty in 55 GAL DRM
1	53	748865	DEIONIZED WATER CONTAM. W HEAVY METALS	Y	00001	INA 111612	1/B			
DOT : HAZARDOUS WASTE, LIQUID, N.O.S., 9, NA3082, PG III, (METAL CONTAMINATED WATER) (D004,D005, D006,D007) ERG# 171 D004,D005,D006,D007,D008,D010,D011								1 DM	1 DM	1
IL Auth# N/A Tank: Quote: 150949 Scale: 556								Gallons:		LBS: 195

Item	Prod	HES Doc	Common Name	RCRA	GenDoc	State Manifest	Pg Ln	Ordered Qty Unt	Shipped Quantity Unit	Received Qty in LB
2	105	748866	TYVEK/PPE CONTAM. WITH HEAVY METALS	Y		Same	1/A			
DOT : HAZARDOUS WASTE, SOLID, N.O.S., 9, NA3077, PG III, (METAL CONTAMINAEDPPE AND TYVEK) (D004, D005,D006,D007) ERG# 171 D004,D005,D006,D007,D008,D010,D011								1 DM	1 DM	1
IL Auth# N/A Tank: Quote: 150953 Scale: 556								Gallons:		LBS: 67

Item	Prod	HES Doc	Common Name	RCRA	GenDoc	State Manifest	Pg Ln	Shipped Quantity	Received Qty
DOT :									
IL Auth#		Tank:	Quote:		Scale:			Gallons:	LBS:

EMERGENCY CHEMICAL ASSISTANCE TELEPHONE NUMBER: 1-800-827-5221

LAST PAGE

MAIL TO GENERATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WOOD RIVER QUADRANGLE
ILLINOIS-MISSOURI
7.5 MINUTE SERIES (TOPOGRAPHIC)

SE/4 ALTON 15' QUADRANGLE

Produced by the United States Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1947-48 and planetable surveys 1947-48. Revised from aerial photographs taken 1988. Field checked 1993. Map edited 1994

Universal Transverse Mercator projection
10,000-foot grid ticks: Illinois coordinate system, west zone and Missouri coordinate system, east zone
1000-meter Universal Transverse Mercator grid ticks, zone 15, shown in blue
1927 North American Datum (NAD 27)

North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Gray tint indicates areas in which only landmark buildings are shown

UTM GRID AND 1994 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24000

1 KILOMETERS 1
1000 0 METERS 1000 2000
1 .5 0 MILES 1
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET

CONTOUR INTERVAL 10 FEET
SUPPLEMENTARY CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

COMPLIES WITH U.S. GEOLOGICAL SURVEY STANDARDS FOR SPATIAL ACCURACY - CLASS 2

FOR SALE BY U.S. GEOLOGICAL SURVEY DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND ILLINOIS GEOLOGICAL SURVEY, CHAMPAIGN, ILLINOIS 61820
AND DIVISION OF GEOLOGY AND LAND SURVEY
MISSOURI DEPARTMENT OF NATURAL RESOURCES, ROLLA, MISSOURI 65401

A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Alton
2 Bethalto
3 Prairietown
4 Columbia Bottom
5 Edwardsville
6 Granite City
7 Monks Mound
8 Collinsville

ADJOINING 7.5' QUADRANGLE NAMES

ROAD CLASSIFICATION

Primary highway hard surface
Secondary highway hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U.S. Route
State Route

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1995

WOOD RIVER, ILL.-MO.
SE/4 ALTON 15' QUADRANGLE
38090-G1-TF-024

1994

DMA 2961 I SE - SERIES V863

ISBN 0-607-1R220-8
9780607192209

D47

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

Submitted to:

Mr. Brian Freeman
U.S. Environmental Protection Agency
Region 5 DE-9J
77 West Jackson Boulevard
Chicago, Illinois 60604

Submitted by:

TechLaw, Inc.
20 North Wacker Drive, Suite 1260
Chicago, Illinois 60606

EPA Work Assignment No.	**R05020**
Contract No.	**68-W4-0006**
TechLaw WAM	**Patricia Brown-Derocher**
Telephone No.	**312/345-8963**
EPA WAM	**Brian Freeman**
Telephone No.	**312/353-2720**

August 19, 1998

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

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FIELD SAMPLING AND ANALYSIS REPORT

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HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

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FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

1.0 INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) Region 5 requested TechLaw, Inc. (TechLaw) to support the Agency in conducting sample collection at the Chemetco, Inc. (Chemetco) facility in Hartford, Illinois. This document constitutes the Field Sampling and Analysis Report for waste, soil, surface water, and sediment sampling performed by TechLaw at the Chemetco facility.

The sampling event occurred on May 28 and 29, 1998 and was undertaken in accordance with the Site-Specific Sampling and Analysis Plan (SAP) submitted to U.S. EPA on May 8, 1998. The SAP was used in conjunction with TechLaw's U.S. EPA-approved Region 5 Generic Quality Assurance Project Plan (QAPP) for Sampling Operations, dated January 1995. TechLaw utilized QST Environmental Laboratory (Gainesville, Florida), a TechLaw Team Subcontractor, to perform the analyses required under the SAP.

The sampling event was undertaken by TechLaw Field Team members Mr. Kevin Higgins, Mr. John Koehnen, Mr. Doug Updike, and Mr. Anthony Mubiru. Also present during the sampling event were Mr. Patrick Kuefler, U.S. EPA Region 5 and Mr. Chris Chanovsky, Illinois EPA (IEPA). Chemetco was represented during the sampling event by Cindy Davis and Heather Young of CSD Environmental Services (CSD), environmental consultant to the facility.

Maps showing the facility layout and sample locations are provided in Appendix A. A Photograph Log of the sampling event is provided in Appendix B, and Field Logs of all sampling activities are provided in Appendix C. Copies of the chain-of-custody forms are provided in Appendix D, investigation-derived waste manifests relating to the sampling event are provided in Appendix E, and a USGS topographic map showing the facility location is provided in Appendix F.

2.0 FACILITY DESCRIPTION

The Chemetco facility is located at the intersection of Illinois Route 3 and Oldenberg Road, in an industrial and agricultural area in Madison County, Illinois (Appendices A and F). Chemetco operations are conducted on an approximately 40-acre parcel of land surrounded by a chain link fence. Chemetco owns an additional 230 acres of land in the vicinity of the facility. The Chemetco facility is located in the floodplain of the Mississippi River in an area locally referred to as the American Bottoms. This area is characterized by relatively flat topography which typically produces minimal runoff.

The Chemetco facility was constructed in 1969 and initiated operations as a copper smelter in 1970 to derive copper and other non-ferrous metals and alloys from recyclable copper-bearing scrap and manufacturing residues. The Chemetco facility produces anode copper, cathode copper, and crude lead-tin solder. The facility generates four primary solid waste streams, which are waste slag, zinc oxide, baghouse dust, and spent refractory brick.

Waste slag at the Chemetco facility is generated from both water-cooled and air-cooled processes. File material indicates that slag is stored on-site in areas identified as "Units" (Appendix A). However, during the sampling effort, no distinct boundaries were observed separating the Units, and it appeared the facility managed a single continuous slag pile (Appendix A). Information obtained from the IEPA indicated that the slag had historically been shown to be characteristically hazardous for lead using the Toxicity Characteristic Leaching Procedure (TCLP).

The facility operates a total of four baghouses to control air emissions from the various operations of the smelter and slag granulation processes (Appendix A). The facility has indicated to U.S. EPA that the baghouse dust is TCLP hazardous for lead and cadmium. Currently, the baghouse dust from all baghouses is reportedly transported off-site as hazardous waste. The four baghouses are designated as:

- No. 1 Baghouse;
- No. 2 Baghouse, also known as the "Roof Baghouse";
- Slag Granulation Plant, Primary Baghouse; and,
- Slag Granulation Plant, Secondary Baghouse.

Process wastewater generated from a venturi scrubber system is currently discharged to an open concrete tank for settling solids which are subsequently de-watered in a zinc oxide filter press. The filter cake from the press is described as zinc oxide. In the past, process wastewater was routed to lagoons for settling and subsequent de-watering of the residual solids. The resulting material was stored on-site in a zinc oxide pile which was later converted to a Zinc Oxide Bunker. Currently, zinc oxide is staged in this location prior to off-site disposal. The facility has indicated to U.S. EPA that the zinc oxide material currently stored in the Zinc Oxide Bunker and the current zinc oxide generated at the facility are TCLP hazardous for lead and cadmium.

Spent refractory brick from smelting operations is currently generated and stored on-site. Up to five types of spent brick, of various compositions, are currently generated at an unspecified rate. Information obtained from the IEPA indicates that the spent refractory brick is TCLP hazardous for lead and cadmium.

3.0 SAMPLING AND ANALYSIS PROCEDURES

3.1 Waste Streams

The four primary waste streams of concern were characterized during the sampling effort: waste slag, zinc oxide, baghouse dust, and spent refractory brick. All sample numbers and sampling locations (Figure 2 in Appendix A) were determined under the direction of Mr. Kuefler.

Chemetco representatives collected split samples of all waste slag samples and spent refractory brick samples collected by TechLaw. Chemetco did not collect split samples of the zinc oxide or baghouse dust samples collected by TechLaw.

3.1.1 Waste Slag

A total of 20 waste slag samples were collected from the waste slag storage areas (e.g., "Units") and analyzed for RCRA TCLP metals. The total number of samples and the location of the sampling stations were determined in the field at the direction of Mr. Kuefler. In general, sampling locations were spread across the waste slag storage areas (Photos 1 through 19) and comprised waste slag pieces of various sizes. In addition to the primary waste slag storage area (i.e., Unit 5) in the northwest corner of the Chemetco facility, waste slag was present across the facility in piles and in roadways (Photo 32).

Five waste slag samples were collected at the slag hopper conveyors (Photos 1, 2, 3): SL-001, SL-002, SL-003, SL-004, SL-005. Four waste slag samples were collected from a large, excavated area in the vicinity of the waste slag pile (Photo 19): SL-011, SL-012, SL-013, and SL-014. Three waste slag samples were collected in the northeast portion of the waste slag pile: SL-018, SL-019, and SL-020. Eight waste slag samples were randomly collected along the slag roadway leading into the waste slag pile : SL-006, SL-007, SL-008, SL-009, SL-010, SL-015, SL-016, and SL-017.

All waste slag samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl. Samples were collected as composites of sampling locations except for samples SL-006 (Photo 5), SL-013 (Photo 13), and SL-014 (Photo 13) which were collected as discrete, samples of fine waste slag material. The composite samples were collected by sampling from at least three sub-areas within a sampling location. These locations were randomly chosen and were generally in the center of the sampling location.

The composited materials were then homogenized to further aid in collection of representative samples.

At some locations, plastic bags were required for the collection of waste slag samples due to the inability to reduce the size of waste slag pieces to facilitate sample collection in 8-ounce, glass jars. The use of the plastic bags is a deviation from the SAP, but is not expected to have an impact on analytical results since inorganics are the constituents of concern.

3.1.2 Zinc Oxide

Four zinc oxide samples were collected from two areas of the facility and analyzed for RCRA total metals and RCRA TCLP metals. Three zinc oxide samples were collected from the Zinc Oxide Bunker (Photos 21 through 25): ZO-001, ZO-002, and ZO-003. One zinc oxide sample (ZO-004) was collected from a front-end loader at the filter press (Photos 26, 27) which had been filled directly from the wastes generated at the filter press on May 29, 1998.

The Zinc Oxide Bunker samples were collected in close proximity to the north portion of the bunker as the wet, un-compacted material represented a potential hazard in relation to collapsing. In addition, an air-purifying respirator (APR) was worn during sample collection.

All zinc oxide samples were collected as near-surface samples from a depth between zero and 6 inches below ground surface. All samples were collected with a stainless-steel spoon and were homogenized in a stainless-steel bowl.

3.1.3 Baghouse Dust

One baghouse dust sample was collected from each of the four baghouses: No. 1 Baghouse (Photo 28); the No. 2 Baghouse, also known as the "Roof Baghouse" (Photos 29, 30, 31); the Primary Baghouse of the Slag Granulation Plant (Photos 33, 34); and, the Secondary Baghouse of the Slag Granulation Plant (Photo 35). The samples were numbered consecutively from BD-001 through BD-004.

All zinc oxide samples were collected as discrete, samples from a depth between zero and 6 inches below the surface of the dust. All samples were collected with a stainless-steel spoon and were homogenized in a stainless-steel bowl. In addition, an APR was worn during sample collection.

3.1.4 Spent Refractory Brick

A total of six spent refractory brick samples were collected from several co-mingled spent refractory brick piles on the southeast side of the Zinc Oxide Bunker (Photos 36, 37, 38, 39, 40)

and analyzed for RCRA TCLP metals.. Five brick types were selected in the field at the direction of Mr. Kuefler. The bricks were broken with a hammer and cold chisel to facilitate collection of representative samples and samples split by facility representatives.

A sixth sample was collected as a composite of smaller brick pieces in the pile. This composite sample was collected using a stainless-steel spoon and homogenized in a stainless-steel bowl.

Plastic bags were required for the collection of the spent refractory brick samples due to the inability to reduce the size of brick pieces to facilitate sample collection in 8-ounce, glass jars. The use of the plastic bags is a deviation from the SAP but is not expected to have an impact on analytical results since inorganics are the constituents of concern.

3.2 Soil

A total of 13 soil samples were collected in three general areas surrounding the facility: parking lot (toe area), former spent brick pile, and east runoff area. All soil samples were analyzed for RCRA total metals. Chemetco representatives collected split samples of all soil samples taken by TechLaw.

Four soil samples were collected from the parking lot (Photos 41, 42, 43, 44): SS-001, SS-002, SS-003, and SS-004. Four soil samples were collected from the former spent brick pile to the south of the facility (Photos 45, 46, 47, 48): SS-005, SS-006, SS-007, and SS-008. Five soil samples were collected from the east runoff area located to the east and northeast of the waste slag pile (Photos 49, 50, 51, 52): SS-009, SS-010, SS-011, and SS-012. All sample locations were determined in the field at the direction of Mr. Kuefler.

In addition, three background soil samples were collected and analyzed for RCRA total metals to determine natural, background concentrations of inorganics in the vicinity of the Chemetco facility. One background soil sample was collected in the south wetland area (Photo 63), and two background soil samples were collected in a grassy open field in the area of a residence south of the facility across Long Lake (Photos 64, 65).

All soil samples were collected as near-surface samples from a depth between zero and 6 inches below ground surface. All samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl.

3.3 Surface Water and Sediment

A total of eight surface water and eight co-located sediment samples were collected from four different general areas of the facility property and were analyzed for RCRA total metals. Chemetco representatives collected split samples of all surface water and sediment samples obtained by TechLaw.

Three water/sediment samples were collected in the surface water body to the south of the facility identified as Long Lake (Photos 53, 54, 55): SW-001/SD-001, SW-002/SD-002, and SW-003/SD-003. Three water/sediment samples were collected in the south wetland area located to the south of the parking lot (Photos 56, 57, 58): SW-004/SD-004, SW-005/SD-005, and SW-006/SD-006. One water/sediment sample (SW-008/SD-008) was collected in the east runoff area (Photo 62) were it was observed that runoff from the waste slag pile was occurring and had accumulated in this area. One water/sediment sample was collected from a pond identified as a non-contact cooling water pond and stormwater pond within the fenced facility (Photos 59, 60, 61): SW-007/SD-007.

The surface water samples were collected either by directly dipping the sample container into the sampling location or by collecting water in a certified-clean, 8-ounce jar and transferring the water sample to the sample container. Field analytical parameters, including temperature, conductivity, turbidity, pH and dissolved oxygen (DO) were collected using a Horiba Water Quality Monitor. However, due to equipment malfunction, DO measurements are available only for surface water sampling locations SW-001 and SW-002.

All sediment samples were collected as discrete samples from a depth between zero and 6 inches below ground surface. All samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl.

3.4 Quality Control Samples

TechLaw personnel collected three types of Quality Assurance/Quality Control (QA/QC) samples: field duplicates, matrix spike/matrix spike duplicates (MS/MSD), and equipment rinsate blanks. One field duplicate was collected for every 10 environmental media samples collected per matrix. An MS/MSD sample was collected for every 20 environmental media samples collected per matrix.

One equipment rinsate blank was collected for every 10 samples collected which utilized the sampling equipment. The equipment blank was collected with certified de-ionized water provided by the contracted laboratory. The equipment blanks were collected from the decontaminated auger heads, a stainless steal spoon, and a stainless steel bowl (Photo 66).

During the course of the sampling event, seven field duplicates, nine MS/MSDs, and five equipment blanks were collected. All QA/QC samples were handled in the same manner described above for the environmental media sampling.

3.5 Sample Custody and Shipment

All sample containers and sample bags were appropriately labeled and tagged in accordance with TechLaw's U.S. EPA-approved Region 5 Generic QAPP. A chain-of-custody (COC) form (Appendix D) accompanied the samples from the point of origin to the analytical laboratory. All

samples collected by TechLaw remained in the custody of the TechLaw Sampling Team until shipment to QST Environmental (Gainesville, Florida). All samples were shipped overnight via Federal Express on June 1, 1998. All samples were received by QST Environmental on June 2, 1998 with custody seals intact, as identified in the QST Cooler Receipt Form (Appendix D).

3.6 Data Validation

Analytical data generated by QST Environmental was provided to TechLaw in conformance with Contract Laboratory Program (CLP)-like reporting protocols. All analytical data were validated by a member of the TechLaw Team, independent of the sampling team utilizing the *Functional Guidelines for Inorganic Data Validation.* Specific data package and data validation procedures are outlined in TechLaw's U.S. EPA-approved Region 5 Generic QAPP.

3.7 Decontamination and Waste Management

All sampling equipment used in the sampling effort was decontaminated before the sampling event and between sample locations using an Alconox® soap wash, a tap water rinse, and a deionized water rinse. Sampling equipment utilized in this effort included stainless-steel spoons, auger heads, and stainless steel bowls.

All investigation-derived waste (IDW), including the decontamination water and all personal protective equipment (PPE), was accumulated in two, 55-gallon, steel drums which were staged on a pad in a secured area on southeast portion of the Chemetco facility property. The staging of the drums was undertaken per the direction of facility representatives from CSD.

A U.S. EPA Identification Number (ILP200000130) and State Of Illinois Identification Number (1198015008) were acquired to allow for the management of the two drums of IDW. Manifests were completed for the two drums of IDW and were signed by Mr. Kuefler, U. S. EPA (Appendix E). The drums were labeled hazardous for RCRA TCLP metals, minus mercury. The drums of IDW were transported by Heritage Transport (IND058484114) on May 29, 1998 to Heritage Environmental Services (IND093219012), a permitted treatment, storage, and disposal (TSD) facility. The two drums of IDW were received by Heritage Environmental Services on June 6, 1998.

4.0 ANALYTICAL RESULTS

4.1 Waste Streams

Analytical results of the waste stream sampling effort are presented in Table 4.1.1. through Table 4.1.4. Undetected constituents are flagged "U" with a corresponding detection limit. Estimated values are flagged "J".

4.1.1 Waste Slag

Analytical results of the waste slag RCRA TCLP metals analysis are presented in Table 4.1.1. All 20 waste slag samples contained TCLP lead concentrations above the regulatory limit of 5 mg/L. Two waste slag samples (SL-014, SL-018) contained TCLP cadmium concentrations above the regulatory limit of 1 mg/L, and waste slag sample (SL-002) is near the cadmium TCLP regulatory limit. No waste slag samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver.

With regards to the waste slag TCLP lead results, statistical calculations were performed on the reported concentrations with the following results (mg/L):

Mean	35.2
Standard Error	4.52
Median	32.75
Standard Deviation	20.23
Sample Variance	409.45
Range	68.1
Minimum Value	11.8
Maximum Value	79.9
Confidence Level (95%)	9.47

The confidence level of the mean (9.47 mg/L) indicates that 95 percent of all TCLP lead results are between 25.7 and 44.7 mg/L (35.2 mg/L +/- 9.47 mg/L). The lower confidence limit of the mean statistically provides an estimate of the minimum value of 95 percent of the slag material which was characterized. The confidence level indicates that 95 percent of the slag pile area which was characterized has a TCLP lead concentration of at least 25.7 mg/L, which is over five times the regulatory limit (5 mg/L). Thus, while 100 percent of the samples are at least two times the regulatory limit (minimum value 11.7 mg/L), over 95 percent of the samples were statistically characterized as over five times the regulatory limit.